NEWS IN BRIEF

National mini threat to DEC

THE direct challenge to Digital Equipment, expected for some time from National Semiconductor, has taken an important step nearer with the formal announcement by National of the Scries/200, a femily of minicomputers said to be totally softwere and I/O-compatible with the DEC PDP-11

when Series/200 marketing will start in the US or Europe following its filing of a federal auti-Irust suit against DEC over DEC's patents.

Groundless fears

FEARS that Doncaster law courts officials would be able to access personal information held on the local authority's machines have been described as groundless by the leader of the town council, Coun Les Adams. The local branch of the National Council for Civil Libertles had asked for a planned fink between the courts and the conneil commuter to be delaved. The link was proposed to help the cnurts clear off a back. log of administrative work.

Viewdata software

A VIEWDATA software suite for the Philips P800 line of minicomputers has been developed by the company in Holland to give Philips the necessary expertise for a possible morket entry in the future, but at present it is for internal use only. It will also enable Philips to take part in the growing debteta on international

Bankers' dual 2960

MERCHANT bankers Morgan Grenfell have decided to replace their ICL 1902T and 1903A mainframes with a three Megabyte dual 2960. The existing workloed will run under DME+ while new systems are developed under VME/B using the IDMS system

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£18,000 stroil

BAD weether did not dempen the enthusiasm for the 17th annual Begis Stroil lest weekend in Manchester. The 55-mile walk was spensered by Computer Weekly and the 3,000 entrants helped raise £18,000 for tocal charities. First back was Malcalm Bittack who completed the route to night hours, fellowed by another 448 finishers seriving titreugheut the dey. Soveral Cemmedore Pets were located at checkpoints and linked to Medular One and CDC 7800 mechines and were used to menite:

Mere then 25,000 welkertransactions were precessed

during the walk.

Pictured right are some of the

Ops paralyse the Paymaster's office

COMPUTER MEDIA

government boat again this week by pulling out 40 computer operations staff from the Paymaster General's Office in

Members of the Society of Civil and Public Servains and the Civil and Public Servains Association taking part in strike action are adamant over their claim, and this latest blow to the government must come as

a shock. The Paymaster General's Office is essentially the government's banker, hundling financlal trensactions for every department except the inland

Revenue and Custome. Functions affected will include the provision of information reinting to spending and borrowing requirements and this could seriously upset preparations for the Budget on April 3.

Latest details from the two unions on the general effects of their week-old selective strike action around the country is hat businesses have bean deprived of between £100 and £200 million.

What le described as "a fair amount of panic" hae resulted from the strike by computer staff at the Government's Communications Headquarters in Cheltenham, necording to Alastair Graham. deputy-

have been overwritten and stated that pay increases based rulned totally as a result of in-experienced people trying to get with the final portion paid out around our strike nellon at GCHQ," sald Graham. Pickets at Chellenlum, which

houses the hot line to Weshings general secretary of the SCPS, ton, have turned away fuel sup-plies. Only two days' fuel be made. But key questions still remains and the unions claim have to be dealt with, and if that the eltuation will soon be- these are not concluded to our

"Many confidential tapes Friday, March 2, at which Pearl

on April 1, 1980.

this is a move forward," sold Campbell Christie, deputy "and we expect other moves to ome critical.

A meeting with Lord Peert.

satisfaction we have a Phase 2 package of strikes planned."

German viewdata contract for ITT firm

THE contract to equip the German national Bildschirates jewdata centre has gone to the German substiliary of 171 Standard Elektrik Lorenz but even the company itself does not yet know what it has been contracted to supply.

"The details of what we will be building have not yet heen settled, but it should be made clear this week," an SEL spokesman in Stuttgart tole omputer Weekly.

The most vital question i whether SEL is being asked t build a computer to run the Post Office's Prestel viewdata software, which the German PTT the Bundespost, has bought as the basis of its own national system. The phraseculogy of the contract lumlics that it is, but observers believe

t highly unlikely.
"It seems certain that SEI will be asked simply to procure and install GEC 4080 computers to run the initial system," said Roger Woolfe, o consultancy Butler Cax and

"I think the Germans will live with the 4080 for a year or tivo, and then replace the whole system with a new one ranning on Indigenous hard ware.

"It would be a mistake assume that Prestel will be come the Internationn

No back-up plans for Talisman

NO back-up plans have been made by the Stock Exchange to deal with a strike hy operators of Tallsman, nanoseconds, three times and the computer-based settlement system, even though it will probably be handling most of the UK's stock as existing Micronovas trading business by the end of the year. Director of the Tellsman project, John Wutson, tohl Computer

The board level MP/200 at the control of the year. Director of the Tellsman project, John Wutson, tohl Computer

The board level MP/200 at 1801 and 1801 Weekly, "There is very little we could do about a lahour problem and it would not be feasible to trainsfer 64K hytes costs £1,80 h gr the Tallsman system to a bureou if there was a strike. But wa have very good inhour relotions here. A few littles of 25 plus, while the second countries of the chussis version costs \$2,481: of our operators belong to ASTMS, but the reet of our computer staff are non-union

Watson pointed out that the members have been about the Talisman system was wall pro-tected against physical fallure or damage. The IBM 3031, on which the eystem will run, le duplexed with a 370/15g and to allow for the unlikely destruction of the installation the SE has acquired an empty computer suite where new kit could be up and running within two or three

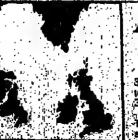
To bridge the gap, Talisman would be run temporarily on a machine at some other big IBM installation, and Walson revealed that the SE was currently negotlating an agreement along those lines with "e

financial organisation.' Asked how quickly IBM could provide naw hardware in the event of Talisman destruction. Pleasey US sale Watson said, IBM have said PLESSEY has sold its US core that they would pull out all the PLESSEY has sold its US core

proposed charges for the system, and the SE Council has written to members agreeing to defer a final decision on the scale of charges until July.

The man who will run Talleman, Michael Baker, director of settlement services, pointed out that the SE will only need an extra 80 or eo full-time cierits to run tha system, while brokers should be abla to divest themclerical staff. Talleman will eliminate existing procedures like stock splitting and cer-

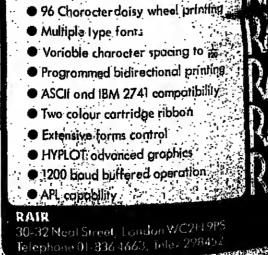
live on April 9, only two weaks later than originally expacted.



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The MP/100 family terrain

the total to 128K byte

acturding to DG.

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SPECIALISTS IN PUPIT COMPANY

AN enchanced version of 16-bit Micronova micromosiscer, the MN602, has been nounced by Data General with the MP/100 family MN602 based computers At the same time It having dured the MP/200 family at

> weald-wide, 18M is mable to give a firm date for deliveries of machines ordered since March 9, when the "window" for the ballot closed and it is possible a second build will be held, as happened with thc8100.

12. ruler-computer will his the mirocomputer, yet will probably use nothers to the mainframe. This is one of the views likely to be expressed at the infolerly European Computing Review. . five-day conference to be held hi London ut the end of March Puttlng this view, Lionel Green · ······ director of Grandmel Section Processing will

..... In' wait should therefore take the initiative in development of micro-based

Share sale

BIRMINGHAM-based systems house Applied Computer Techniques is offering 10% of its shares for sale on the Stock Exchange. The shares in the privately-held company are not quoted but It hopes that they will be dealt in on the unlisted securitles market. The move is seen as a first step towards going public. Applied Computing Techniques forecast profits of £360,000 in the year to March 31.

Service with 2020s

THE In-house mainfrema service soon to be introduced by GSI UK (CW, March 8), will be based on Digitel Equipment 2020 machines like its competitor, the Onsite servica offered by Automatic Deta Processing. As an elternative to the DEC 2020, GSI UK will supply an as yet unnamed machine but it will not on the Continent. Sea page 11.

Decision delayed

A DECISION on the siting of Mostek's European manufac-

duman aspects

A SEMINAR on "The Human leage. Starting time is 2 pm and number will cose so

COMPUTER WEEKLY

Computer Service

Number 644

Marie M

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Briefing

4300s ballot results soon

MORE than 500 orders for IBM's new 4331 and 4341 mainframes have gone into the UK ballot for first deliveries, and customers will be notified shortly of the place they have been allocated in the shipment queue. If this figure is reflected throughout IBM, it implies an order level of over 5,000 for the new muchines

Micre inreat

more for less and loss. Noyce will appear in next wask's "We are rapidly approaching Computer Waskly.

AFTER falling in a bid to gain contrb) of Nixdorf (CW.

November 30, 1978), German

motor glant Volkewagen has

succeeded with Triumph-Adler.

the Nuremburg-based office

computar and typewriter com-

pany formerly controlled by Lit-

major capital restructuring,

with an injection of naw money totalling DM 34.5 million, elmost £10 million.

The total capital of the com-

pany rises to DM 80.5 million, d

which Volkswagen will hold 55%

while Diehl's shara risee to 25%

from 12.8% and Litton's fells

from 65% to 19%. The remainder is held by small shareholders.

from the agreement last year

under which Triumph-Adler

ecquired control of the Diehl

Diohl's Involvement arises

The agreement involves a

ton industries of the US.

Offe of the highest homours that can be given to its do UK for days suggested in the chack, formula is a control of the highest control o Tricel Engineers' Feradoy Model,
was awarded last week to Or
Robert Noyce, chairmen of Intal,
of microelectronics and law cost for conspicuous service to the computing power an society, and edvancoment of electrical suggested the start day at a

Dr Noyco soon hose [heft] modern hinch that he may represent the factor of modern and the receiving the mediation of the factor of the property of the receiving the meaning that the meaning common that the receiving the receiv Interrated circuit was now bo- words mail is tower also mailite coming the epitemo of en- nel lotter writing and posting," he ginacring expertise, in that it was continually able to offer more and

of Triumph-Adler

Volkswagen buys control

An exclusive interview with 0

to the multi-terminal business

systems manufactured by an-other Dlohl subsidiary, Com-

puter Technik Müller (CW. May

11, 1978). Under the agreement,

Diehl ended up with 12.8% of

Trlumph-Adler with an option

to increase this to 25% which it

now intends to exercise.

of a sursystem, Pripos and a feath from Stemens and CH. the damage was a constrained Honeywell Bull. last work by Camoraly at a The EEC said The EEC said last year that one-day user group and said de-voted to BCPL (see Software language, n development of an the ESL could be an existing

File, page 7). ICPL is the high-level system existing language, or a completely new language (CW, August 10, 1978).

The meeting was arranged by Tollec Date, which is to market Tripos, under the name Trout, and is to begin marketing the ring system in the summer.

The meeting itself provided being shown In BCPL by Siemens, which had four delegates ettending from Germeny. This could indicate that BCPL is under consideration for the propoeed European Systems

Appeal for Soviet scientist

last week's IFAC symposium in Toulouse on automatic control and operational research tech- software for an artificial haart niques used the occasion to application. eppeal for Soviet oybernetician. At the symposium, a letter Professor Alexandar Lerner, who has been wolling eight

been repeatedly rajected on the grounds of "accese to secret in-formation," has been without

TOP-LINE scientista attending professional employment since first submitting his visa forms. He hee used the time designing

tists was haaded to the Sovict years for n vise to emigrata to delegation. It axpressed the erael. hope that the delegates would Lernar, whose application has do all in their power to get Prof seen repeatedly rajected on the Leroer "raintagrated into tha

Why le ISM being to perjarous to usars? The performance/course to usars? The performance/course to desire the models are quits dramotle. Fred Lamond analyses the motives being the personal analyses the motives being the personal transfer of the Addright of Reditor Gemputers, quilling some of the obstacles that have to be averome to win addressed. These are just two of the segurate in this week's international section.

With the proliferation of computer networks the need for standard protocols to enable them to talk to each other has become vital. Distait Barter, director of EIN, puts for

Computerview on key to survivid Focus on thinking small Euro stenderde co-ordinator

JOB VACANCIES: PAGES 23-70

Strike likely to cause cash flow problems

CONTINUING and additional industrial action by million. A lengthy dispute is likely to cause sovere members of the Society of Civil and Public Servents cash flow problems for both small and large companies as well as other groups such as fanners. The Ministry of Defence computer installation in ilikely. The partie convents Association seems likely. The partie or indications of e settlement, and a spokesman for ECPS told Computer Weekly that there was a lementable lack of organicy in the government side. No further meating with Lord Peart to government side. No further meating with Lord Peart to government side. No further meating with Lord Peart to government side.

Division alang is beliaved to be expecting about £6 Ferces penalons.

is planned, eithough the unions were to meat because they say, "ind-ince payments will be difficult to verify and check afterwords".

No VAT repayments are being made by Customs

The dispute is hitting the affice of the Paymester

and Exclae. The average pay-out to business is General herd. However, agreement has been reached namedly £122 million and Oritish Steel Carp Expart for e skaleton union staff to ensure the payment a

Portable 'ring main' system developed at Cambridge

A POSTABLE minicomputer operating system and processor-speed data ring hardware, sloped by a Cambridge University roam, could herald a new gra of machine independent distributed processing. Both are to be a parketed by Yeleo Data at Lamburdge his ed collectiware

Designed to take ndvantage of

A few network using both the later the study contract to a joint

implementation language in which Tripos is predominantly ives its portability.

collapsing processor costs, the Cambridge developments make possible a "ring main" com-puting system, in which each processor enjoys compatible access to any other device in the

Such a system is widely seen evidence of the keen interest as an ideal campus network, Turn to page 2

2000 GBB 1880

THE first Lloyds underwriting group to reveal that it will lose money from lusuring the residual values of leased IBM computers is the Sasse syndicate which has estimated that it is likely to lose \$6 million on policies written in 1977.

Loss adjusters have already reported to a special Lloyds working party that underwriters could face cloims totalling £110 million on the residual value. policies. Other estimates put the figures nearer £200 million.

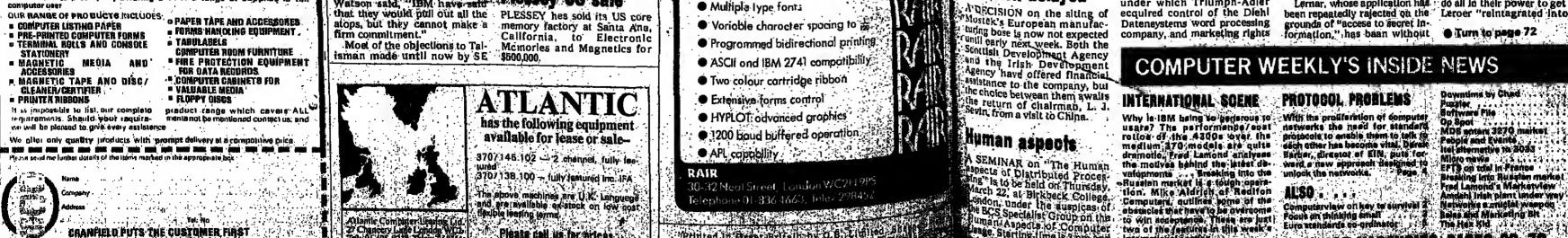


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Aspects of Distributed Processing Is to be held on Thursday, and Distributed Processing Is to be held on Thursday, and the BCS Specialist Group on the lumant Aspects of Computer Issae, Stating It as 2 and 1991.

ward a new approach designed unlock the networks. ALSO

• Iniel 8085 microprocessor

● 54K byles RAM memory

Floppy disk operating system

● ANS COBOL 74 compiler

programme for schools and col-

provide a springboard for soundly-based wider develop-

ments throughout schools and

further education colleges by

This proposed investment is

welcomed by Computerview. It

s announced none too soon: the

US and Japan are clearly ahead

Some schools have already

taken the initiative and

purchased or been given small

computer systems. For Instanca,

at Marlborough College, the

public school in Wiltshire, even

first-year pupils ara given an

introductory course, with programming in Basic taught in the

second year (CW, February 23,

Given the opportunity, the

enthusiasm shown by school-

children in learning how to mae

THINKING small is hardly one of the DPM's more noted approaches to work. Over the

bigger, better and often more

However, all could now ba

about to change. According to Ted Cluff (CW, February 22), the

Institute of Data Processing

Management is not only conducting an industry survey on

the impact of inicro technology,

but is also setting up a micro

user group for busineases and

The DPM, it seems, will have

to adapt to new techniques. No

longar will an order be signad for

that 64K mainframe with fingera

crossed that an extra 64K

memory will not have to be

added on three months after

implementation. He will settle

for a 16-bit mlcro-based system

and any upgrade would involve

adding-on another micro with

on-chip storage.
Full-acale feasibility proced-

MARCH 13, 1969

first multi-socose system for

ICL's Bystem 4/40 and 4/80 was launched by the company. Called Multitest, it provided an interactive version of Fortran and could handle up to 18 terminals... For the dual role of an anime investigation and data

antine investigation and data retriaval system with real time and batch proposeling espects, Crown Agents were purchésing a Honeywell H1250 with 18K store, four tapa decks, four disc drives and four video terminate in each of the main offices

complex resources.

the professions.

in both education and the uses

exploiting exiating skills.

of microtechnology.

The programme sets out to

eges (See page 3.)

Thursday, Märck 15, 1979

Gareth Jonas 01-261 6033

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Class Ad Manager Brian Durrant 01-261 8597

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Computer Weekly has a circulation satweek of ever \$2,000 including the righ-est fully requested circulation in the UK The Interestional edition, which is

ISSN 0010-478

COMPUTER WEEKLY

THE GPO sterroid demonstra-

tions to users of art offline date

cepture system that was said to have great PoS possibilities . . . ICL won £780,000-warth of

to the least from the East Germene at the Leipzig feir end further orders warth £3.5 million were said to be in the pipeline. The proposed takeover of Scientific Data Systems by Xerox was approved by both boards, and the phreholders would be saked for their blessings at annual

for their bleesings at annual meetings on May 15 ... The

THERE is no time to lose if we are to make successful use of microelectronics and, as Jim The key to Callaghan has aald, the government intends to play its port in ensuring that Britain is in the forefront of developments. industrial This role includes in Itlatives in the fields of Industrial training and education. Last week, the Department of Education and Sclence, in n consultative paper outlined a five-year, £12 million microelectromics development

Alongaide this activity la the rapid growth in amateur computer clubs whose members pool experiences and Ideas in exploiting the capabilities of their micro-based machines. The acceptance of the computer as a multifunctional domestic hobby makes it a marvellous educational tool; the relatively high cost of entry is the only major barrier

The Introduction of computers in the school curriculum has been a Department of Education major worry for some time. Making teachers aware of the value of the computer as an educational resource, as well as Its importance, is an objective of a £70,000 School Council project announced at the end of 1978

(CW, November 16, 1978).

computing generations, he has been conditioned to meeting the ever-increasing demands with higger better and often more

When small is

dant. Choosing between the rival merits of IBM and Honey which is being cut down to size.

of tha local byte shop, en- hand experience that computer

period it takes to phone for advice or open the user do-it-

yourself manual; and delivary pens to faca north, be sited next

schedules, the time it takes to to the line-printers or near a

could keep pace with thair expanding requirements all would assemblar language and structed well. No sooner had one tured RPL. This is accepted in

technology been explored, than many quartars and there is

dangerous

ures could well become redun-

well could-involve comprehen-

sive power/performance/cost

formules. There is, however, less

at stake, particulorly in cost,

when the choice is between an

For the DPM, selection in any

case usually extenda beyond

that of pure cost. Factors such as

back-up, engineering response

time and dalivery dates often

weigh the scales of selection.

Back-up for the micro, however,

could well be the opening hours

gineering response time, the period it takes to phone for ad-

It is not just the work-styla of

the winds of change. Gusts are

blowing towards the analyst and

programmer, Not so long ago, the DP team had an assured fu-ture. Provided technologies

another arrived, Bafore the DPM.

ger which is facing

unwrap a micro.

computer science courses at universities are about 50% higher than last year, a figure which clearly shows a recognition of the importance of computers (no doubt motivation for this interest includes high salaries, security in the seemingly endless expansion of

ave Cobol, will travel"). But a knowledge and acceptance of computers do not open the door of economic salvation and prosperity. They are only a

the industry, and the many

opportunities for those who

Education, of course, does not finish with the completion of school or higher education. At whatever stage formal schooling finishes, sooner or later the adoption of new tech-At the top of the educational nology is likely to mean the computer shows no bounds. tree, applications to enrol for retraining. The less skilled the

mlni ond micro, the DPM sua-

which is being cut down to size.

As a result, there is an inbuilt

suspicion of micro salea promo-

The professional manager can

forecast problams ahead of uny

potential users. Con the product,

as advertised, be really "ready-

for-use?" The power, it is being

suggested, will be in the hands of

be held bafore the equipment

can be converted into full-scale

equipment seldom performs as

The DPM knows from first

Such random tactics are not

to be recommended with micros

Anything harder than a alight

nudge could well prove fatal. It

is claimad, parhaps with jua-

tification, that large machinaa

ancourage axtravagance with

, already a move back to one-step

practical working modea.

the user but hands will have to

urged governments to rethink the educational system to elleviote the effects of muss un-

digita

digital

digital

person, the greater the threat of

But other changes are needed

puters on employment levels.

the Energy Minister, called for a

complete rethinking of our

increased education to cope

with increased leisure time and

the likellhood of shorter weeks and shorter working lives.

At the back of every working

person's mind must be the fear

of replacement by mochine. This

union leaders. The unemployed

have no voice. The unskilled,

unqualified 16-year-old of 1984

the same time we have to har-

technology in manufacturing

educational system. He urged

computer industry.

The current education proin the door. We mitst make sure

Portable 'ring main'

• From front psgs We have witnessed tremenproviding each student researcher with a low contr. dous changes in technology in the last 25 years and the technical demands placed on the soft-ware and hardware designers sonal computer that can the more powerful hardwater mean constant revision of ideas software in the network is and adoption of new techniques quired. at un increasing rate. Constancy

An attractive alternative is not a characteristic of the large time shared maintage constitutes in effect a local-With this horizontal growth in sion of such services as Arpa technological amplication and The Cambridge ring se

vertical growth in complexity may also have a strong my there has been a corresponding for certain commerced and proliferation in seminars. tions, notably where come courses and conferences. There prortability is required with is a course for the computer distributed database systems professional on any subject, The operating system of lowever obscure.

ponent, Tripos, is at pressingle user, multi-task opens system that includes fells in the educational system and these ore the attitudes necessary for compiling, linking, and hugging BCPL program it to cope with the effects of coineditor, and a file handler. In May last year, Tony Benn,

Fortran and Basic men nected to be added by then; mer, with Pascal and in under consideration for he implementation. There are is plans to adapt the systemb multiple users.

sists of standard twin-we: cable and a number of Dates. communication ports, on fear is often voiced by trade which is required for each p cessor, on the ring (CW, S: teinber 14, 1978). Data is to: ferred by the ports at around: might never find work, but at Megablt per second and un. round the ring in the ness the most apphisticated packets, only internate muchine to which is 2 and elsewhere) to survive as an dressed.

Currently Implement ndustrial nation. This is our printed circuit boards. almut £1,500. Ihe im; likely to be available at: twin chip device in about?

In the operational Carta: ring. Tripos is already ne on three processor types Computer Automation Is.
DEC's PDP-II, and the D General Nova.

TERMINALS

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Call for central agency to run £12m micros in schools programme

invited to reply by April 12.

the next five years. The agency

would have a steering commit-

tee with members from local

authorities, teachers' bodies,

ond such organisations as the

Schools Council, the Council for

Education Technology, and the

The DES recognises that the agency's work could overlap

with that of existing bodies and

says that it must be able to co-

operate with these. For instance,

the programme might fund the

introduction of new equipment

for partleular projects in

schools, but the continuing sup-

ply of such equipment would

remain the responsibility of local

Computer-Aided Learning

will be a particularly important part of the programme, not

having established itself widely

in schools so far, according to

the DES. There will need to be

an early assessment of the scope

for expansion of CAL in schools

and colleges. Further education will also

education authorities.

National Computing Centre.

ment's programme for promoting microelectronics in schools, funding curriculum development projects and teacher

> WP convention for London

THE impact of the introduction of word processing systems on paraonnal will be one of the aubjects to be discussed at the Second international Word Pro-cessing Convention in London in May. Labour MP Eric Moonman with be dealing with the problems and benefits of the introduction of these systems and the reaction on the lebour

Frank Cowson will talk obout the Post Office plan for elec-troic mell and how far the cor-poration is committed to these tachniques, while Devid Deli will took at the government's Other sponkers have been

newn from the US and Sweden and the conference to be hold a a Carlion Tower Hetal on May I and 2, will be chaired by Tory MP Kenneth Baker. Further deiells can be had from the organ-issis, Management Studies Canics, 51A Osorgo Street, Richmond, Surrey, TW9 1HL. Fae for the two days is £150

principal recommendation in a as will the implications of inleres consultative paper Issued by the for vocational training, such as Department of Education and their effect on secretarial skills. Science. Interested parties are Social effects, such as on employment, will however not The government estimates he covered, nor will the techno that £2.5 million a year will be logy of microelectronics itself spent on this programme over Applications is the central

> Pairick Raymont of the National Computing Centre, said that the organisational proposals "made sense", adding that he was pleased that the NCC would be included on the steering committee. The success programme, he said, would depend largely on the steering committee starting up worthwhile projects.

> Assessing suitable equipment for use by schools and colleges will he another of the programme's tasks." These plans are for England.

> Wales and Northern Ireland only. Separate work is being done on plans for Scotland.

Doug Eyeions vice-president of CSA

DOUG EYEIONS, technical director of BOC Computing Sorvices, has become the vice-president of the Computing Services Ascocia-tion, following the election of Jim Donoldson so prosident (CW, Februse 15).

February 15).
Also taking up new appointments are assil Cousins, of Computel, who will be chafman of the membarship committee, and Ann Russell, of F Interactional, who has become absimus of the over has become chairmen of the ex-ternol services committee.



'Open government' proposals

THE government is expected to prohably take the form of a put forward proposals of its own far "open government," In cont-Freedom of Information Bill, at the same time as the publication later this month of a survey af the operation of such laws in other countries. This makes it less likely that Freud's Bill will he given the extra time it needs In order to get through its Report Stage on the flaor of the Commons (CW, March 1). The proposals, which will

"consider" requests to see documents from members of the poblic but would not be compelled to disclose anything. This is unacceptable to Freud and his supporters, who want a stictutory right of access.

Green Paper, are expected to be

In line with current policy of

both front benches - that civil

servants should be required to

A survey of nverseas experionce, will go hito the cost of

Post Office introduces fax service

FOR A limited facsimile service to be introduced in the London and the North Eastern telecom munications regions, the Post Office has ordered 100 Sieniens HF 1048 transceivers.

The Group 2 devices transmit or receive a full A4 page in three minutes and this is cut to two minutes where one HF 1048 is communicating with another The facsimile machines will be delivered from Siemens at Congleton, Cheshire.

The corporation calls the service Fonofax, and will oller two other machines as well as the Siemens derice, tine will be the ITT Creed 3500, and the other will come from an as yet unidentified supplier.

£1.1m order

COMPLETING the reorganisa tion of its computing facilities around Honeywell hardware, Strathelyde Regional Council has ordered a second Level 66 nutificame and three Level 6 minicomputers, altogether

Now it's as easy to buy an add-in memory board as a can of beans.



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could mutter Masa Array on • Memory Amdahl, a new technology Tha balance between auccess Interface Boards bubbia burst on the scene. and failure in micro computing Computer databases wera ex-, is very alandar. Maybe it is just tronics and the microprocessor. • Power Supplies panding almost as fast as the as well that the IDPM will be on DPM's seat of power, But with ! hand to make-do ond, when Back Planes + tha currant emphasis on the necessary, mend.

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THIS weak's axample of funny things people say in the media about computers was sent in by Steve Mansall of Southampton, who wins

Alistair Cooke in Letter from America BBC Radio 4 Lot (0272) 2906-1 leter 1412 talking about credit agencies

Wilkes Computing Ltd.

Timetable for Times technology agreed HIE thorny question of direct In order to keep down costs. Detailed recommendations

input by journolists at The Times, left unresolved by last week's agreement on talks between management, and unions, seems likely to lead to a phased introduction over a number of The National Graphical

Association, the main print union, while sticking to the view that it should control all key-boarding, has agreed to the principle of timetables for the introduction of new technology and staffing levels, with "arrangements for fulure joint

After three months' suspension of The Times titles, a formula was reached whereby the unions agreed to talk in return for reinstatement and back pay for suspended staff. April 17 has seeo set for reopening publicayon. Any Issues left unresolved April 7 are to be referred to ACAS for concillation; but this, unlike arbitration, would not be ding on either side.

At the same time, the Price Commission published a report on the request by the Dally Telegraph to raise Ite cover imission

were made, and the advantages of direct input expounded. In-dustrial relations need to be improved and overmanning reduced, the report said. Last week's accord at The Times has to be rallfled by union

members; so far only the NGA rank and file have agreed, but most of the other union general councils have done so. Several other issuea need to be sorted out with management,

including a disputes procedure and "efficient working arrange-menta," with a productivity deal. An NGA spokesman said he thought it ahould be possible to realart production even if ail issues are not resolved by April 17, but management la unilkely to agree to this.

Hitherto the NGA has refusad even to talk about direct input, What seems most likely now is that a contract will be reached similar to that at Exprass Newspapars (CW, March I) whareby NGA membars will be given the job for a spacified number of will be discussed again. There Beesled that the Telagraph for staff to have joint membercould also be an arrangement introduction of new technology Union of Journalists.

Expanding micros in industry

AREPORT from the Committee of Directors of Research Associations has been sent to Secretary of State for Industry.

Associations has been sent to officials and the CDRA is expected within a fortnight, at packed within a fortnight, at which the report a proposals will Eric Variey, outlining a £2 mil-

MOORE REED & COLLTO

COUPLERS

which the report's proposals will flon programme for expanding the exploitation of microsiec plans to promote grants inplans to promote graatar in-dustrial awareness of microalectronica, the provision

microalectronica, the provision of more anginaering training courses and places, the provision of long-term projects such as workshop training facilities, and the provision of wider and more comprehensive information sarvices.

Some money for the programme is expected to be available from industry with the Doil providing the balance.







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DIGITAL MICROSYSTEMS DSC-2 LOW COST COMPUTER SYSTEM INCORPORATES:

Ten years ago...

LOW COS | CONTROL LET OT OF THE MIND HIDE BY drives standard of ONE MEDABYTE of Goppy disk asynge by two single yided BY drives standard of GRAND HIDE Meditory standard of 32% and 48% also evaluable. OF CONTROL FOR TRANS

1984 and all that

It all goes to show how stupid and malicious computers

New approach to network protocols

When computar systems of diffarent types began to be linked by data natworks two major problame were encountered. One was how to connect a computar to e natwork, the other was how to meke it interect in exceful way with other computere, and with terminels of various kinds.

The idas of levared protocols, pionoared in research networke like ARPA and EIN, provad a velueble solution to the first problem and is now

tion for an interface, at the pecket level, to public seams naceasary. This must take cognisence of the

in research nets and now in CCITT and ISO, le to maintenence, if "opan working" through public extend the layered concept to oven higher layers of deta natworks is to become an averyday affair. protocol, in an attempt to egree on stendards to be Here Derek Barbar (right), director of the European observed by interecting computers. But the complexities when a general solution is acught era to protocols.

saen, for axempla, in the CCITT X25 recommands proving quite formidable, and a new approach cheep logic and storega now available to promote To solve the second problem, the present trand eesa of undaratending, implementation and



* < "You don't know me, but...

been a growing awareness of the fundamental problem with the concept of "open working" between different computer systems connected to the public data networks.

Quite simply, the problem is to know how two computers, that have never before met each other, can establish contact through the network and then. carry out a sophisticated transaction of some kind. The short answer scems very clear — they cannot. However, given a modicum of help, they might.

Hitherto, the approach to solving this problem has been for people to agree upon standards that they will implement in their computers so each computer interacts with the benefit of a priori knowledge of how the others will behave. This has worked well for mundane tasks like setting up calls, but the unknowable variety of future interactions that might occur make the prior agreement of complex codes of behaviour rather difficult. This is why the development of invered protocols at the higher levels is such a

An alternative approach, which is the subject of this note... is to invoke the aid of people when the computers first come into contect, rather than before string BACK SPACE to be Igthe event. This can be done by including information that is intelligible to people along with the data that is to be exchanged by the computers.

It allows people to intervene the first time each kind of a hitch occurs, in order to devise some way for the interaction to proceed. Once their solution has been codified, it can be applied automatically by the computer, and enda; for example, should the same circumstances

might be called "frea-form" protocols is that solutions need be found only for problems that actually arise, and people and computers need be concerned with those kinds of interaction that do reelly occur in

The crux of the problem encountered when two strange computers attempt to Interact is to know how to interpret the files that they exchange with each other, bearing in mind that different systems have differing conventions about the wny their files are constructed.

When a sender's conventions cannot reasonably be expected to be known by a receiving system, it is fruitless to try to use them for a transaction, instead. the local idiosyncrasies have to be spelled out in simple terms meaniugful to the receiving system; this may conveniently be done by embedding explanatory messages within the transmitted

As nn example, instend of including a non-printing formatin order to indicate, say, a back space, it is much clearer to literelly, say "BACK SPACE". But this roises the classic problem of transparency which, in this context, means "How is the nored when it occurs in the body of the file os part of the messege?" Ae an illustration consider the sentence "The team adopted a new formation, with the full BACK SPACEd well forward.

One way to distinguish a special string is to enclose it within delimiter symbols that indicate clearly where it begins *<"BACK SPACE">*. This combination is likely to be rare

rence in history is right here in this note.

As an aside, this same problem of delimiting "asides" occurs in dialogues between people, and perhaps this is why misunderstandings arise and why humour ls possible. The sblutions that humana have evolved are well known and rely on the expansion of statements, their iteration and the use of interactive question-and-enswer dialogues. It seems likely that the application of artificial intelligence techniques could result in something similar in our future com-

puter systems. Of course, the technique of including asides for people in data destined for computers is

Pre-transmission

process expands

codee into strings

Creates and adits file

In his own format

and probably the first occur- they should be replaced by descriptive names.

Sometimes these can be wellestablished ones, like the nomes of the chnrncter code combinntions used in the ISO 7 hit alphabet. But, more generally, it will be up to the file originator to select a string that he thinks will be correctly understood by anyone who has to Interpret his

Because there need be no restriction's whatever placed upon the string, it may refer to anything at ail. Thus *<"FORM FEED"<**>"SKIP 20 LINES">* and *<"MESSAGE FOR OPERATOR - PLEASE MOUNT TAPE XYZ" > * are nll

The first of these replaces a

PUBLIC

NETWORK

Body of Ille

Figure 1. Fito expansion and compression by free-form protocols

with embadded

the lirst file and parse it them- panded file, the strings; selves, in order to identify any They can inte these and them in whatever way

they wish. This provides the information needed to allow suitable local file-handling processes to be designed to parse subsequent files automatically, based on the assumption that the originator will be consistent in his use of delimiter strings. it is the originator of a file who, presumably, wants to

delimited strings.

impart his information to the reciplent, so it is intuitively right that the responsibility for the success of the scheme proposed here should lie with him. Every file transmitted should be read-Ily canable of accurate inter-

Post-transmission

strings Into codes

Run as a

job with

APPLICATIONS

local

The proposals would ref. the amount of an necessary to devise tacer togols, since virtuitan liminary document #25% are necessary. A pa evolve, in a purely seeresults achieved coults veyed and published &: standards would thus without lengthy discusse alternative choices in suc dising committees. Itstandards would not cet any hypothetical cases:

out to have been wasted

It might be argued that it ideas would produce t pil work implementation will cessive modifications and acc tions. But there seems to k reason why knows techni should not adequately keep trnl - there is a relection the situation would be not than that arising in the implementation of a 12.4 ciaborate) protocol distribution vacuo by a committee in the committee in by successive modificate mect unforeseen practical

it might elso be appe implementations, and in diversity of forms to be

replaced by the equivalents: olism that happens to understood by users and terns at that perticular sich is muite opposed to the orbit idea of compacting informe tor storage and transmission make these operations:

sideration in this new aperis the ease of understanding from the stillity of proper work out what is happening complex system. For it it Improvement of the over economics of systems, ledel: tireti lisers' costs, rather #: the optimisation of small pr of them, that will beincreas important in the Jure

take out a maintenance contract for it. Yet every few weeks, regular as clockwork. more glossy brochures from IBM plop through the letter box soying "Wouldn't you like to buy our letest all £14,991. papering the walls. never occur in practice, the cussion of which takes of much time, ultimately tar.

implementation also would eased by not having todals. such cases, and there could progressive evolution by furm of consecutive addition n developing sound but it had aiready been well tested.

straints.

ready to make use of the ea-toblishment when it auits them. A publisher's footnote warns "We will prosacuta copyright violatora", ond in the article on forging birth certificates, the budding rebols are advised by the

todaya "Freedom Fighters" have joined society and your local Che Guevaro cell is

Carter confusion

vears ago.

UK Post Office,

Earthy

THE doggedness of salesmen can be quite touching, can it not? A friend of mine works

as a secretary for a well-

known charity, and lias of typewriter so untiquoted that

no service firm is prepared to

T seems Bill Davie and his merry men at the new Finan-cial Weekly are under the impression that President Jimmy Carter's family business is making acoustic couplers, not peanuts; also that he was president 11 Margaret Thatcher has been

advised to follow President Certor by anding talecom municellans monopoly . . . Tory thinking has hardened considerably since the idea was floated a year ago by St Kalth Joseph, Mrs Thatcher's eanlor potloy advisor, and considerable interest her bean taken in the success of the "Certerfone" decision in The report, called "The Status the United States.

Doubtless Jimmy took this

step after reading the Carter Report nn the future of the

Introducing the report to UK users Buss sold, "The lack of ndequate resources for suppor

Memory up and prices

tially ficrce competition from IBM's General Systems Division with the new System 38 database-oriented small business computer. Honeywell has cut prices and booated memory capacity on Its Leval 62 line.

The line has been reconfi gured into three new models which form the 62/X5 line, cur rently comprising the 62/15, 62/ 25 and 62/35. The principal change is a doubling of maximum msin memory to one Megabyte and the use of 16K memory chips throughout.

Honeywell began offering 16K chips on Level 62 last summer (CW, June 29).

The 82/15 model with 258K bytes of main memory, 80 Megabytea on disc, eight com municatione linas, four VDUs and a 300 1pm printer costs just under £50,000, and a similar configuration with one Megabyte costs £83,500. Rental on this is £3,610 a month, which implies that the purchase price la written off over about two yaars,

Univac's new line in reply

RATHER than almply cut prices and apply new technology to essentially unchanged products, Univac is to respond to IBM's 4300s with a completely new line

So says Duene Klipatrick, an-alyat with New York brokors Dean Witter Reynolds, who believes the new line is reedy for release immediately. The new machines are expected to offer competibility with Univac's VS/ 9 operating system, buil to fea-ture significantly enhanced. operating software.

Downline European users appoint a standards co-ordinator

standards to the EEC Commission, the Conference of European Computar User Associations has appointed Brian Busa to co-ordinate the views of the user groups from all over Europe. The CECUA was recognised by the Commission last year as the representative organisation for users in EEC countries (CW, December 7,

financial watchdog, the General Accounting Office, in a report Buss is a member of the UK's National Computer User Forum end ia its delegate to the European body. Ha is chairman of the Forum working group which has just published report on standards (CW, Merch

of Standards In Computing". will be discussed et the next meeting in Brussels of CECUA on May 17/18. The meeting was nriginally intended for the end of

tions were putting more effort

mon Operating Systems Command Language committee to develop a common JCL (CW, March 16, 1078). The head of the BSI technical department that covers computers, Roy Hodgkinson, said The views of CECUA could that only two full-time member of the BSi sccretariat were working nn computer standards. Other EEC standerds nrganisa-

"The Germans have a lot more

serious financial consequences

for all computer users.

Voluntary effort is not enough."

To underline hia point Buas

referred to the \$450 million a

year conversion costs incurred

by US government installetions. The \$450 million figure was

quoted by the US Government's

tssued at about tha time thet

Codasyl, the body that gava

birth to Cobol, set up its Com-

Standards institution in the computing sphere could have He added that If the users'

forum wanted the recommanda tions in its report implemented in the UK It should loan somebody to the BSI for a year or ao at no expensa to BST.

NCUF report include the development of atandards for the computer environment and a stendard code of practics for the quality assurance of computer selection and instelletion. Buss, who works for the Cen-

tral Electricity Generating Board in London, will liaiss with appointed stendards representatives within sach user group in the European association, collecting ond conveying their views to the EEC Commission.

provide useful Input to the EEC's working group on DP standards which in turn could have a major influence on the shape of the EEC's four-year

Recommandations in the



BUSS.... "voluntery affort is not

The programms hes yet to be

In the UK, the National Computing Centre will use NCUF's user views in its standards promotion activities which include information and training services. Fur some time the NCC has been calling for more. government aid for standards promotion (CW, February 16,

trips

8PECIAL excursion visite to major European exhibitions are evelished to Computer Weekly roaders. These have been

The first visit is to the inter-national Electronics Components show in Peris from April 2 to 7, for which two April 2 to 7, for which two three-day visits have been erranged. The first leaves on Monday, April 2, and the second on Wodnesdey, April 4. Flights ere from London and the cost perpenson is £139.

For Honover Fair, from April 18-20, there are two four-day tours which include three nights at the Hotel Kenigshof, Bed Seynhauson. Tour A leavas on ridey, April 20 and raturns on Monday, April 23. The all-inclusive cost is £225.

The third visit is to Compac Europe in Gruensis from May 8 to May 10. The first trip has boan orranged especially for exhibitors and covers five nights from Sunday, May 8 to Friday, May 11. This costs £205 por person. The second tour runs from Tuesdoy, May 8 to Thursday, Moy 10, and costs £148.

Full details can be had from Commercial Trade Travel, 6 Bouthampton Row, London WC1.

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64 peripheral channals in total		Up to 1000 installations across the world	Г
S OMA Chennals		Choice of BASIC, FORTRAN, ASSEMBLER, MATHCHAT, LABCHAT, plus user supported languages	Ē
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As an intelligent terminal it can a) talk to the central machine		Floating point hardware.	<u> </u>
b) run balch work c) support interactive users		ADC DAC OLI OLO	<u>L.</u>
d) run compiled Sasic a) hilid a, b, c, d, simultaneously		Full printer spooling as standard feature of BASIC and FORTRAN.	
As an ICL FEP (7903) it can run up to 32 lemmes and drive interactive BASIC simultaneously.		Disc capacity of 0.3 M bytes to 200 M Bytes	
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rogram our micro combellive evelam — upgrada li onto our mini end end up on our 20 tarminel magamini. - then attach remola users yla modama and - double the diac capecity. Whelevar you do, your software is unchanged and projected. Your usere cen upgrade on elte.

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Special travel arrangements to visit the **Hanover Fair**

IPC Elactrical-Elactronic Press Ltd., the world's largest publishers of computat, etactricel and elactronic journals, have made spacial aurangemanta for raadara wishing to visit the Henovar Fair The cost Includes - travel by 3.

accommodation * arrival and dapartura transfars * edmission to the stade fair * earvices of an axperienced tour managet. The piogiamme comprisas of the following tours.

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exchanges of appointment of the Comment of the Comm Tour B - April 20th - 23rd 1976, 4 day (3 nights) etco at the Hotel Konigand. Fully inclusive price £228 [] Tour A - April 17th - 20th 1679. 4 days

(3 nights) at the Hotel Korrigeh Fully inclusive price £225 [

grams themselves is a familiar example. However, the use of mplementation and subsequent meintenance of systems by program at all.

people, does seem to he a new This brings out a vital prin-

be embodied in messages and files, it would be useful to have a should parse the contents of tha universally accepted pair of de-limiters auch as "<" for opening whatever it finds. Often this will apecial stringe and "> for result in changes being made, sired delimiters could be dec- corresponding ISO character.

There may be a temptation to changed. enlerge upon this scheme by In this way, the file will having neated strings with con- emerge from the handler with ventions for using the de- fewer delimited strings than limiters, for example:

cause it is e return to symbolism remains can either be displayed thet needs agreement by the to a user, if it is a message for communicating partners, if levels of command exist, as is job—if that is its nature, and its levels of command exist, as is job—if that is its nature, and its levels of command exist, as is job—if that is its nature, and its levels of a file on the second of a file of a second likely, they should be dia-

not new. The use of COMMENT well established ISO nonin programs to separate explsprinting chnracter, so need not nations for users from the proreplaces twenty-line feeds by about the some number of orinhe technique with high-level ting characters, while the third protocole, to facilitate the one is probably not intended to be understood by a computer

ciple that should govern the way If comments and asides are to a file is handled by the receiving system. The local file handler by a suitable statement But anything that cannot be inmede at the beginning of a file. Terpreted must be left un-

when it was first received. *<"*<" Third level com- Obviously, it may then be submitted to a aecond level of This should be resisted, be- handler, and so on, until what

The proceesing of a file on tinguished by a plain longuage reception can, therefore, be-description.

pretnting by uny intended human recipient who cares to read it us a simple string of characters, ideally, a sender should be consistent from file to file in his use of natural inneaage commands, usides and comments: otherwise the receiver will be for ever having to update his model of the

closing them. However, should these not find favour, any de
<"FORM FEED"> by the to understand any future

to local usar

In his own

This note has, of course, used the Latin alphabet, and has 7-bit code. These are both sufficiently well known to introduce files to most system designers in most countries, although they might conceivably be used merely to say "the est of this file is in Chinese and he delimiters are."

The use of the proposed theme would be the both sufficiently with consequence of the proposed theme would be the both sufficiently with consequence of the signal with consequence of the consequence of the proposed theme would be the proposed to the

rated by Figure 1 which is selfdescription.

In preparing a file for transmission it might be thought best difference between this conventions about codes; to expunge all non-printing approach and the alternative structure, etc. happen to apply the structure of the file is sent to apply the structure. to expunge all non-printing approach and the alternative characters and replace them one of agreeing multi-level prowith explanatory strings, but toools in advance. It is that the receiving file-handling process of universally accepted on be designed on the basis of ones like "carriege return" and the files that are received, with space. However, where there out necessarily having any contagened on the basis of ocal, non-standard uses of symptoms and so that the recipient's test at all with their originator, on, by axpanding them into expect them any misunderstand any control or format characters, systems programmers to look at the recipient's systems programmers to look at the receipt of such an expension of the local blanatory at fings.

There is, however, one essentiol requirement, namely, the need for a universally accepted alphabet to begin the first interoction. With this, the originator of a flie explains what recipients agea that he sends to them.

scheme would be straightforward in practice, and is illust-

processor? To you, only Since my friend is into Friends of the Earth, saving super, that sort of thing, it is doubly painful. She could always use the brochures for

Phreakish THIS week a copy of TAP, the newsletter of the US

phone phreaking phraternity, landed on my desk. It is a special double edition to mark the seventh anniversary and carries a circulation-building leaflet headed "What the hell is Well, according to itself.

TAP is "for the exchange of enti-aystem technical informailon", and lt.provides. mong other things, detailed wn lock picking kit, forcing prepare false birth cercates. In a tone of redeced frustration it offers ita bscribers a gamut of activtles including the conatrucion of Blue Boxes for cutting into telephone networks systems for bypassing elec-

ncity and water meters and TAP's originatora, you night gather, are inclined to be anti-establishment, an attitude of "if you can get if whout paying your ahare, However, the TAP ara

outhor, "Agent MDA", to use the Yellow Pages to find some of the gear needed.

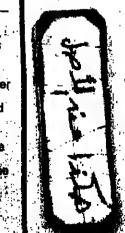
it's nice to know that today's "Freeder Elektere"

likely spon to be rubbing shoulders with the Consarvative Club for e place in the community.

an indication that Honeywell ia encouraging purchase ovar ren-tal and that the machines have a limited life-apan.

to raplace the 90 series.

Kilpatrick says that by reason of e well-amortised installed base, Univac is best placed of the US mainframes to compete successfully with the 4300.



For easy

transition

to Series

SOFTWARE enabling IBM System 32 users to migrate smoothly to the Series 1

minicomputer is being deve-

loped by a US software house,

Series One Inc, of Granville,

GILB'S MYTHODOLOGY

Need for training & in program maintenance

LAST November, s New York client described a pressing problem to me. The maintenance people they had for thair most critical online system (one with 1.800 terminal operators) kept quitting on them fostar than they could be replaced.

The client was hiring recent computer scienca graduates, training them in sssembler and the "system," only to find that thay then decided that the pressure of 400 or more backlogged change requests, and a critical online system upon which hundreds of employees were dependent and with which the general public came into regular contact, was too much of a

They quit in slx months. This ied me to wonder oloud to them if they had similar problems with their msintenance people for the company's electrical systems in the fleid. Or for that matter did their supplier iBM, experience similar problems of instability with their field maintenance

Moybe if we recruited atomic physica graduotes to naint atonic reactor power stations, they would qui their job too? Maybe if IBM took experienced computer wiring technicians and asked them to do fleid maintenance there would also be some difficulties:

In the case of my New York client, I had the strong eeiing that the candidatea they recruited were not particularly trained or motivated for tha job they were given. They only took the job because it gave them astart in industry, and they did not understand the nature of the work.

A month later I was visiting sn old professional coileague at a Norwegian technical training college with a recently started

versity students. There was one: In lengthof-study, practical-versusacademic, and even quality of recrultment. But, the baaic syllabus and orientation was not aubatantially different from what we

i raised the question o lege could consider training e specieilst in program maintenance; either as a directly recruited two year study, or as a third year specialisation.

bliahed company using a computer, from 30% to nearly 100% of the programming staff are engaged in maintenance of some sort or other. There would seem to be a real need for people especially trained and motivoted in this area. Yet i have never heard of n training programme especially for program

nance requires a particular typa of person, who might be very different from those who lead projects, deaign systems, or code someone's pseudocode into Cobol.

It is possible that the vaat ques which has surfaced to analyse program actions, ald changes and help with testing, requires in-depth study and orientation by

specialists. In today's immadiate climate in saverel parts of the world, the demand for programmers is artificially high. This stete cannot last. and we night wall again see

191 High Street Kirkealdy Sth. Flieshire 161-0592-3196

computers. My colleague had s simultaneoua commltment to graduate computer sciance students at Oslo University, so it was natural that we asked the question of what difference there was between the technical colleges and uni-

ask if some of the over production ahould be gueranteed useful employment by being recruited and trained especially to solva the demanding problems of program maintanance. The specialisation is necessary now. In the long

over-production of com-

puter specialists. This might

be the time for both centres

of training and employers to

run It is inevitable. I suspect

our profession will be unu-

sually slow in responding to

Perhsps some readers sre

aiready engaged in aome

less formal recruitment and training for maintenance

dapertments, ond can

report stable and succassful

professionals. Perhaps some

training institutions are

already training for this

specialty. It would be in-

teresting to hear if this is so.

HAVING taken over from Pack-

age Programs Ltd us the UK

agent for Q-Pac (Software File,

January 18), Q-Pac Services has forged a link with Southwark

FOUR new dstabases have been

aiready available under the APL

Three sre in the field of avio-

tion and consist of the Official

Airline Guide (US International

Air Travel Statistics) and the T8

Air Charter Databsses, Sharp is

the first time sharing company

to offer the OAG dstabnse,

which contoins dotu on 200,000

North American ond internatio-

over of £48,000 hava been

software house, Slinn Computer

Group. Representing a growth of 140% over the 1977 figures,

this will be topped this year by a

turnover exceeding £1 million,

according to managing director

Puzzler

time shanng service.

Sharp adds databases to

added by I.P. Sharp to those Petroseries, comprising his-

140% growth at Slinn in 1978

PROFITS of £75,000 on a turn- tasked mainly with bespoke de-

Fsatest growing sector is the Hong Kong subsidiary, which is specialises in VRC software, and Hong Kong subsidiary, which is specialises in VRC software, and the exclusive contrector for Law Data Systems, in Leeds, which specialises in legal applitude the Crown colony. Initially

I HAVE before me a simple, yat faecinating thrae-dimensionel puzzle, consisting of four cubsa painted red, yellow, green end blue, with just one colour to aach side. The problem is to lay them out in a line "shoulder to shoulder" so that each row of four faces (top, front,

The colours ere placed cunningly so that only one besic layout will

do. Lei ma dascribe each cubs in turn. The first ona, as I look at it now, has red on top, yellow at the front

red underneath, blue et the rear, red on the right-hand side, end

green on the left-hand side.

The second cube in my randomly placed row reads blue on top, green front, yallow base, green rear, red right-hand blue left-hand. Colour dispositions on the third nube ere green top, blue front, yellow base, red rear, yallow right-hand, red left-hand.

The fourth cube shows green top, yellow front, red base, blue rear, yellow right-hand, green left-hand.

As you can see, the possibilities are very numerous, but enitable props, such as wooden building blicks will be a great help.

See page 69 for solution.

base, end rear) contains all four colours, in any order,

time sharing service

have seen ell over the world. whether this technical coi-

In almost any well esta-

maintenance.
It is possible that mainte-

array of tools and techni-



Aid to real time diagnosi and recovery on PDP-11

very significant sid to those Implementing real time systems on the DEC PDP-II has been leveloped by the Software Products Division of John Bell Computer Services.
Csiled Radar (Real-time Ald

to Diagnosis And Recovery), the new product provides in a package msny of the logging, monitoring and recovery functions ususily developed as part of the spplication. It thus ensures that such tasks are handled consistantly throughout the application, while also offering a chance to reduca development time-scales.

Radar works by intercepting program calls to the operating system. Such calls are replaced in the user's program with a Redsr macro, which passes the requisite data to the Rader taak

This is an 8,500 byte routine, written in Macro-11, that runs as a high priority task under DEC's RSX-11M, RSX-11D, or IAS operating system.

Radar supports user programs written in Coral, Fortran, or Macro-il and one of its most useful functions is the documentation of program interaction in a multi-tasking en-

has been running the payroll

pockoge since 1970, Is to loin

Q-Pac Services in a joint mar-

keting venture. Where required,

Also newly nvailable is

torical time sharing data on

production, stncks, and imports

of crude petroleum products in

With these additions, Sharp

hus brought up to 30 the

number of dotabasea it offers.

They are concentrated muinly in

oviotion, banking, demography,

velopments, the firm has found

an incraaalng market for soft-

ware packages in the last six

months — perticularly for the B80 minicomputer.

In addition to the Sheffield

company, Slinn oparations in

the UK include Slinn Systams

system to its logging file, and a report can subsequently be produced showing which tasks cummunicated to which, and when. This can be used not only to investigate processing bottlenecks, but also to unravel system "locks."

Another Important system function is file security logging. Fscilities sre svallable for logging record Images (and data areas) both before and after updating, and the Images can be used to restore the file in the case of a systam crash or cur-

Where the difficulty of re-

Detuits of Inter-task com-munication are written by the munication are written by the tlons, the Radar log being A PACKAGE that could be a Detuils of Inter-task com- creating s situstion cases. fallure and during the letter compared to ensure that correction has been tested; the same conditions.

A further problem adda.

by Rsdar is error cherk Frequently trested casual user programs, arror to returned by the operating tem are screened consistent Radar will be marketed in

UK by John Bell's software ducts division and in the IX Germony by subsidiaries de John Bell Group. It will be give

Comprehensive BOM

A COMPREHENSIVE bill of by the system, which isp material processor operating on DEC DPD-11 systems is being level and multi-level emizmarketed by Hourds Com- and implosion functions Itputing, of Stafford. Written in are used to support profes-Dibol, the softwore requires in order control, purchase of minimum configuration of a 64K control, and loverlay con.

Up to 100 levels of assembly

Q-Pac offers payroll service

Computer Services, SCS, which It will set up and run a client's payroll on the bureau before it is trunsferred to on in-house com-

. . ICL has released un enhanced version of its 1900 and 2900 DME payroli suite Company, Cailed Compay +, the new system is notable for providing more personnel information and accommodating more complex payslips. A file conversion utility ivailable for the more than 200 users currently running the

okler system Following the selection of Gordon and Gotch's Ensipny service by the Pulytechnic of Central London, a second London polytechnic has contracted its payroli to the bureau. The Polytechnic of the South Bank will transfer ull its 2,200 employees to the Ensiphy ser-

subsystems. Among reports but ou! manufacturing shows la

I buirds, which notes the

system is suitable for bit

shop and mass produce:

vironments, obtained the

ware from the US and so

permanent licence at an en

user price of £6,250.

Zeus-Hermes

reorganisation

THE three other compa

muking up the mirrenrganised Zeus-Hermesga-

(Suffiware File, March II

Hermes Recruitment, and

Albons, Heris.

Plum Designs — a grapher printing company based in

ineuts the basic BOMP on

seven, BCPL would benefit, it is felt, from a written definition. This would naturally include the stock status report; asdic. language core but is particularly praduction schedules. important in the case of the A significant fez: run-time system and the consystem is that it is for troversial orea of language exlivc. A system ment operator processing at: rains are self-prompting

ging rapidly from the under-

with a wide variety of users was

avaliable in plenty at the Insu-

gural meeting of the BCPL users'

group, held in Csmbridge last

Sorprising even those who

arranged it, the meeting

attracted nearly 80 delegates,

including users from several

European countries and many

Also in evidence were

Although now 12 years old,

commercial organisations.

nd and fast finding favour

Notable companies attending and was o recurrent theme included Ford, Siemena, Saab during one of the group's most Scanio, Marconi, EMI, Redifon. informative aessions, in which users discussed their opplicaand Logica. All of these, it cmerged, had either completed A typical example was that of projects in BCPL or ware cur-CERN, where users have access rently in the middle of develop-

BCPL spolicationa.

progress made by BCPL since

three years ago, when the circulation of a draft standard was

met with a reaounding silence.

Tha observance of a strict

standard by compiler writers

would, of course, help to en-

hance the high degree of por-

tability already enjoyed by

Portability is one of BCPL's

principal advantages over its

ususl competitor - assembler

SOFTWARE FILE-2

to a very wide range of muchines and expect to find identical softnumber of major scientific and ware tools on coch. BCPL had research establishments, inbeen used there to build cluding the Rutherford machine-independent user in-Lahoratory and CERN, of terfaces and utilities such as editors and text processors. A With usage growing fast and implementations proliferating. nucior upplication had been the

construction of n comprehensone of the major objectives of the group is to define a language standard. ive network linking the Among those using BCPL for

npplication programming were Ford and Siemens, Ford, for inand relatively stable for the last stance, had written a quality, repair, and surveillance system for a PDP-11/01, while Signers had used BCPL to program its Teleperm-M process control autonution system.

Initially built round the Intel 8020, the system hod subse-

PROGRAMMER NOTES **BCPL SPECIAL**

BCPL was developed by Dr Martin Richards, of Cambridge University, during a year spent working under project MAC at MIT in 1967. Its immediate precursor was the CPL programming language designed by David Barron and Christopher Strochey.

A block structured language, ike Pascal, BCPL is regarded primarily as a system mplementation language, suitable for writing system software such as compilers, operating systems, and utilitles. It is in this sense a replacement for assember, with the advantages of being structured" and portable.

It can also be used as an ication language, though it s here at variance with modern thinking on such languages in not being "typed". (Strong typing was, for axample, one of the prime requirements for the DoD's real time language Ada.) In a BCPL program, for Instance,

It is possible to assign to a labal.

8CPL is probebly best suited to use by expert programmers veloping reliable software quickly. Programs written in it are readily lagible, contributing grestly to ease of maintanance. indeed, one etory told at tha

user group meeting cited a pro-gramming meeting cited a pro-propose meeting cited a pro-locking for the first time at a BCPL program, said, "I can sea the comments, but where it tha code?"; the program contained in no comments.

BCPL is a small language, end, like Pascal, is seen by its ax-ponents as a natural choica for use.on microprocaseore. Its cisimed advantages over Pascal in this and in other contaxts

are twofold.

The first la that it is much closer to the mschina and its operating system. The second ie that all BCPL implementations are code generetlys whereas a

intermediate language, P-code. BCPL also employa an intermediate language, called O-

code, and it is the ease with which O-code to mochine code translators can be built that makes BCPL "portable." Given a compiler front-end also written in BCPL - a code generator for a new machine can be written in a period ususly quoted as between four and eight man weeks.

BCPL has up till now existed as an "underground" movement, centred round Cambridge. The computing laboratory there regards BCPL — and products written in it such as Tripos - ss research reaults: as such. It makes them freely available to other acsdamic institutions for a

nominal distribution charge. Commercial users supplied by tha lab are asked to mske a donation — generally around £250 for e BCPL compiler or the Tripos operating system.

The University of Essex also distributes BCPL aoftwera, having supplied soma 70 users the isnguage. In addition, compilers and other software are exchenged bstwaen users, though this has so far gone on without the help of an activa user group such ee thet enjoyed by Pascal users.

use, a number of software houses are gearing up to dsvelop and sell BCPL software. A key eature le the devalopment of portable compilers written in BCPL of particular note is tha family of "orthogonel" compliers being davaloped by HPAC, of Oxford (Software File,

elso activa in the BCPL field. I will be supplying Fortran and Basic compilers with its supported version of Tripoe, celled good many Pascal systems in lop other compilers for other clude interpreters for the Pascal languages, including Algol

same software. BCPL had been chosen for the application pregave to make use of alternative running on PDP-15s. Although hardware.

Commercial users take keen

notice of 'academic' language

Siemens was also considering using BCPL to develop system software which would be con- 32/75, their experience suggsistent across its complete pro-

Other interesting applications discussed included the development of the Scrapbook text datobase by the Notional Physical Laboratory. Originally written in BCPL for Modular Ones, the system had subsequently been adopted by Triad Computing Systems for PDP-11a running onder IAS.

Triad also reported It hall developed a large datobase in BCPL for the Royal Alreraft Esshnient, Farnburough.

A cantionary note on performnoce was sounded by a

Sweden. Saab, he said, had storted using BCPL for real time the form of s regular newsletter, simulation about a year ago.

nlong the lines of that distributed by the Paacal user group. The first issue is likely to annear in the next few months. probably under the editorship of Jack Lang, from Topexpress. Toltec Data, of Cambridge,

has sgreed to act os the initial secretoriat for the user group, which plans its next meeting around the end of September. The group con be contacted c/o Toltec Dato Ltd, 24 Thompson's Lane, Cambridge. Tel: (0223)

South Carolina. First product from the firm is an RPG II com piler largely compatible with that provided on the System 32. The compiler runs on the

Series 1 under the RPS operating system, and conforms closely to IBM documentation for System 32 RPG II. There are however, a number of longuage features omitted in the first release, in cluding Inquiry interrupt, the copy function, and support for

MVS performance monitor

part, the user group will act as a self-help organisation and one of CMF, is competitively priced its nurjor aims will be to set up was weakened by a significant omission from last week's story it on at least two processors.

THE argument that CAP-CPP's (Softwore File, March 8). Unlike iBM's RMF II, a single CMF licence is valld for multiple CPUs; most UK MVS users run

Data Transmission Managers know AL ...do you?

cess, and they wore currently

implementing BCPL for an SEI

ested that programs ran two to

three times slower than the

BCPL is not known to he sup-

Aport from Siemens, the only

other manufacturer represented

at the meeting was GEC, which

makes o BCPL compiler avail-

able through its 4000 series user

Given the lack of official sup-

channels for the exchange of

ported by any manufacturer,

which reinforces its "under-

ground" stotus.

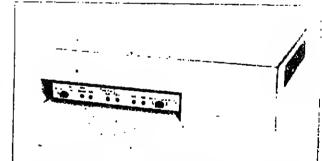
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TAKE THE IAL 2400 EP LSI Modem 2400EP is a synchronous 2400 bps modern which

operates over unconditioned 2 was leased buck It is fully compatible with CCHTA and Bleade modulation for a 2 wice or 4 wire operation. Available stand alone for remote locations, 2400(P contains built in diagnostic function declorally test

in this greategraphic stress in process of a serious metal day transmission to prospect to prothe all programming programs are as a sufficient of the contract of the contra



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Special travel arrangements to visit the Compec Europe Exhibition (Brussels)

IPC Elactrical-Elactronic Prass Ltd., the world's largest publis of computar, alactrics and elactronic journs is, hava mad spacisi orrangamants for rasdars wiehing to visit the Compec Europs Exhibition ha oost includes -



Tour A May 6. May 111678 (Enights)

traval by echedule

siriina from

With growing non-acaden November 30, 1978). Toltec Data, of Cambridge,

Aviation and Communications 🗫 Systems and Services — worldwide

Four-city

tour opens

How a UK ops man in Tehran weathered the Iranian

within 50 yards of his apartment, Grenville Mills decided it was time to get awny from the civil traubles of Iran.

So he took advantage of an escape clause in his contract and resigned from his position as data centre manager at the Tehran installation of Iran Air.

Mills, who arrived in London last week, told me, "It's all calmed down now, but I won't be going back to work there.

I would have come back soon after that incident — at the height of the Islamic revolution - but the evacuation flight tickets cost £350 cach, and so I wnited until Iran Air could fly

me back." The revolution, and the slow build-up to it, with its rejection of Western ways, made the mmagement of his 20 Iranian operators progressively more dilficult.

Keen to put his comments in perspective, he said, "The politics of the situation are not my concern, they are the business of the franian people.

"From my viewpoint, it's a shame that the unrest occurred, as it prevented me from making full use of the potential that

Bernnrd Allen intorviewed Grenville Mills in January 1978, just before Mills left England to become Data discussed how the political unrost, and oventural Centre manager at the Tehren instellation of Iran Air. At that time there was no indication of the troubles

exists there, in terms of the people and other resources. "In the end, I was acting in a sort of managerial and technical advisory capacity, renlly."

Mills, and the six other Englishmen at the installation, put forward a number of ideas and suggestions, intended to improve the performance of the company's two 170/158s. Many were accepted, but they were applied less and less as the troublas increased.

Throughout the time he was at the site, one of the systems was dedicated to the running of the Airline Control Program, ACP, while the other provided back-up for it. The second machine was also used to process development work.

Typically, dumps would be enneelled by the operators for the most trivial of reasons, and deadlines were not always adhered ta.

Said Mills, "We tried to get the franians to see the operations department as a means of providing a service to the user. That

HINT OF THE WEEK You'll be judged by

printed output OF all the tasks operations staff have to perform in the course of duty,

warking with printers tands to be the labet papular.

At batch-oriented sites, it is else the most important, in the sanso that printed output is what the user actually raceivee, and therefore tends to judge the department by.

So when operating the printers, always check for condition of the ribbon and quality of the stationery line-up.

Ramember, though, that the escence of good operating is completing the work in the most efficient and economical manner.

ing that in mind, we have a brief hint concerning printed output. The type of job I have in mind is a spacial payroll which pro

sey, 20 payelips and bank credits, end e email pieln peper listing. Each time you carry out e stationery change, don't bother feeding it through to the back of the printer and folding it neetly on the steckor

instead, laeve the tild of the printer up end let the peper fall over the front of the unit se the output is produced, and fold it afterwerds.
I doubt whether this method can be applied to all models of printer, but it works very well on the IBM 1403.

wasn't always ensy.

They set about implementing input ami output controls, and writing technical manuals to be used for operator training.

He continued, "We had to get the manuals printed in Farsi as well as English, because despite the fact that they all had an excellent command of the English language, they were reluctant to make use of it."

Mills pointed out to the company that by using the second machine for back-up purposes only, it was wasting valuable resources and missing out on the opportunity to make a considerable amount of extra income. He suggested that they sell bureau

You see, airlines must ensure back-up for their hooking systems. So we had an IBM 370/158 practically idle. It was an ideal set-up to do some bureau work.

"I proposed a bureau contract which we could then have offered to other companies which would have undercut the IBM rates by a considerable amount. In the end, the idea was

He suggested that the IBM VM operating system he implemented on the testing machine, on the basis that it would add flexibility to the scheduling of the workload.

"The Alrline Control Program is a stand-alone operating sys-tem, and worked fine for us as fer as the live system was concerned." he said.

"But cach time we wanted to carry out development work on It. OS had to be kicked off the testing machine. And as the operators insisted on running the development work during prime shift, it mesnt that the programmers were not getting mnchine time when they most

nceded it." The company accepted his advice, and by August the VM project had reached the systam

GRAPHICAL presentation at data is the subject chosen as the theme of the 1979 SEAS Spring Technical Meeting. Seas, the association of users of 19M systems with members in Europe, the Middle East

Graphics

CONFERENCES

overflirow of the Iranian government, iffocted him in insed is a great waste."

generation stage. However, by that time the unrest was beginning to manifest Itself to a conshlerable degree and as a result

no further progress was made. Mills also put torward a number of ideas relating to is likely to be cut off at any time. hardware which, again as a To overcome that problem, the result of the unrest, never got as far as linglementation.

"I suggested that the company install T-Bar channel storage batteries are brought

According to Mills, the complex is equipped with a top class. almost "fail sufe" hack-up power "Over there the power supply

new complex has a UPS, unintercupted power supply system. "If the power supply is cut off,



"I cen't see yor, I'm afraid - VOU ayestrain . . . '

switching equipment in place of confine limitediately. And if the use at the site.

"The T-Bor switching units are excellent — they give you dual channel availability on three machines, which was in line with our expension plans. They also give you grent

duling of resources, in addition, they are simple to operate, with very little scope for error." As a result of the troubles, an Intended move to a purpose-

flexibility as regards the sche-

built computer complex, sited near Tehrun airport, was not

PRODUEMS associated with noftware

PROBLEMS assuciated with antiware needs in the herospace, defunce, must electronics industrics will be discussed at the fourth joint European/US actiware management conference, sponsored by the Alte, TTS and TMSA. It will take

place from March 28:27 in Munich. De-talls from AllE International Software Management Conference, o'n State of the Art Ltd, Victoria House, Suite 501,

hemapton Row, Loudon WCIB 4EJ.

COI will present a one-day overview

called Dalabase Concepts, on Monday, March 26. The seminar is designed for those who require a thorough understan-

ding of the concepts of database management and the processing environment in which database is most useful.
The seminar leader will be Stewart Morrick of DBD Gystems. Cantact Teresa Barriard of CDI, on 01-837 2171.

Sald Mills, "It is a superh complex with nil the facilities a computer installation needs, The fact that it has never been

the IBM 2014 switching units in main supply is off for any considerable time, generators are switched on. It's all done automatically, marvellous."

The new complex was to house three IBM 370/158s - the additional machine was needed to run MEMIS, an engineering maintenance and supply systems, Iran Alr was on the verge of accepting both hardware and software, when the revolution broke out.

"The third muchine would also have helped us with the actual re-location - taking back-up considerations into

Then more personal level, Mills was naturally concerned for the

conference, Detalla from A. E. Combon.

The Computing Laboratory, University of Kent, Canterbury.

COMPUTERS, microprocessors and detr

effects on bisinoss management are the subjects to be covered a the third send-nor to be held by the Yarkshire and North Humbersido regisn of the tastitute of

Sirect, Burnburgh, Doncaster, South

safety of his wife and two.

"I sent them back in a December, before the une really bad "

But, the troubles asie. genninely enjoyed bir 45: that part of the world. "It's great over there -1"

ferent world, because years have money warnes like ily and myself were ablent very comfortably and stillconsiderable amount of new As he was out of this a ... for more than a year, thenein unable to claim a single :-

of the income he earned it : Others forced to setura a: sociacky. He continued, "You'chave to be away for the fag. year — from April to April your do have to be out? country for at least 12 m. for your carnings to be made Some people wherement to his hard for tax."

in fact, Mills has tout.-! this country at an fall From a financial views

He explained: "se accountant and he could earn up to flat fortween now and Am: some amount after i:: That's a bit of lock." Summing up his k.

alcout everything the peried, he said, "None du any animosity toward! Air. We are just sorry the were not able to see ther applications through." And despite the prob-Mills and the others were #. develop lines of community

helween operations and: users, and they also mange reduce the turnaround time Currently In London, b work by half.

knoking for another mank ment position in the Mr.

MDS to enter the 3270 market

newly-styled Plessey Telecommunications digital exchange with digitised voice.

ject is now at the software writing stage, and are now being shipped. He dismisses com-

Pitcher asserts that the key to the "office Board's Nexos, commenting that it is "far

of the fitture" is the office computer, which behind", and points out that if IBM were to

will handle voice, facsimile, telex, and bring out such a system as Plessey's, it

typing, covering much more than a word would bring it into competition with its own

processor. 1 DDX digital telephone exchange Plessey's third quarter results, nanounced

processor. Plassey's architecture is centred existing office computers.

with word processors.

"We are the only people selling a fully

Pitcher says, miding that ien units a month

petition from the National Enterprise

3270 plug compatible terminal tion of the Trivex Corp of Costa Mesa, California, MDS will formally introduce the Trivex kit in Europe in two or three months. ing in ngainst established PCMs like Harris and ITT Business Systems, as well as taking on IBM itself.

Des Pitcher, managing director of the

and Office Systems company, says the pro-

set to "slay the opposition."

Trivex which made \$1 million profit on a \$6 million turnover in the first slx months, ended October 1978, of its current fiscal

Until now MDS has concentrated mainly on the butch datu entry murket, originally with its key-to-tope equipment, and since the early 1970s with its

systems. They are nimed at most kinds of mainframe user, in cluding IBM, and MDS can provide support for 18 different communication protocols.

Two years agn MDS udded significantly to its product range with the Series 21 family of low cost microproressor/floppy disc hased terminal chisters for data entry and distributed proces-

> In Europe, Series 21 business now accounts for about 20% of MDS revenues and total European business accounts for half of the company's worldwide

MDS is much bigger in France and West Germany than In the

In the first alne months, ended January 31, of its current fiscal year, MDS chalked up a worldwide turnover of \$129 million compared with less than \$112 million for the same period in the previous year. Net profits were also up — from about \$4.5 million to \$6.5 million.

Rental revenues account for more than 60% of turnover, but purchase business is becoming increasingly important, partly because many customers prefer to buy the low cost Series 21 rather than renting. There are now more than 4,000 Series 21s installed worldwide and in the UK 180 are either installed or on

Series 21s can be user programmed in a simple Cobol-like language called Mobol, and MDS plans to Introduce communications software that will

specialist staff for its operation. Nova system to about £60,000

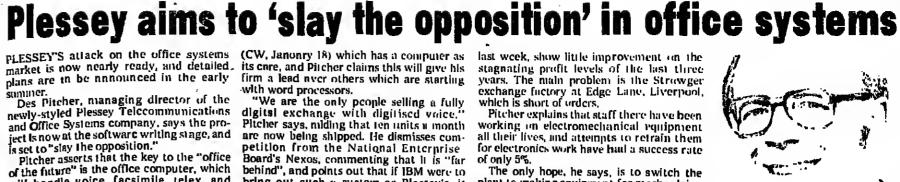
The software is written in Busi- for a Nova 4/X with 15 VDUs.

number of people gained the in the programme and could impression from the Man Alive easily have been intered by programma on privecy that in ... viewers. formetion on those suffering. In a short announcement, from vanereal disease is stored viewera were told that such in-

A REASSURANCE was brond whether one had gonorrhoea. csst last week on BBC2 after a Tha word "if" was the first word

formation does not go on a

In fact, the remark on the being approached by policemen programme was entirely asking for a date. The policemen hypothatical Lord Gardiner, had apparently obtained former Lord Chancella. hed apparently obtained the girls names and addresses by noting their licence numbers and then calling the Polloe



Sharp installs second Amdahl

quarters. Valued at about £1 ½ million, the new system replaced a smaller IBM meinframe and to expected to handle expension requirements for the naxt two

which is short of orders.

of only 5%.

Amang receons citad by Sharp for its choice of the systom were aveilability, eir-cooling, and the use of ceche memory for chan-

THE API, time sharing company
I. P. Sharp has instotted a second
Amdeht V8-ti at its Taronto hasdfects r: the new mechine was up and running on the third day fol

lowing ite instellation. Sharp's two V6-IIs are coupled together as meater-and-slave and run under Sharp DOS throughs ut. Said to be the largest dedicated APL camputer in the world. It will naw he able to service up to 400

and also those of other makes

which conform to CCITT

standards for "groups" I and Il.

h will also work with future

Dexnet range compatible with other facsimile machines

COMPATIBILITY with a wide with all other Dexuet muchines range of other facsimile machines is the principal benefit claimed for the microprocessor control of the Dexnet range of transcrivers, made by Graphic Sciences, a subsidiary of Bur-The range is sold in the UK by

Interscan Communication Sys-

The top model of the range. the Dex 5100, can communicate

which is portable

2900 conversion contract

irnci valued el ovor £500,000 nemed European compony. To be run under VME/B, the work to be converted consists melnly of batch commercial applica-

Marcol le to usa tha 800 Ostassive bureau for proces-

Viewdata group

keting man Malcolm Smith has loined with Barry Standring from New Opportunity Press tems to share peripherals and viewdata consultancy called in

Ona of the first customers for

Mbyte disc at its office in Laeds. This also serves the London

Turnkey management system

BBC assurance on VD fears

committee of the BMA had striot confidentiality completed to the BMC that's According to one of the dounnmer of patients were worried to second the hes encounted and others might be put off tered several cases of attractive asking for treatment.

The fact the remark on the being approached by policement.

digital machines of group III, It can send an A4 page in 20 seconds, has automatic feeding of originals, and prints on both sides of the paper. 4200, which has a top speed of two minutes a page fort has

Other models are the Dex Irom April 3.5. automatic document feed loud answering, and the Dex 1100.

This is Lowndes-Ajax

370/155 – both with MVS/TSO

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responsive computing services offered by Lowndes-Ajax, please contact: Michael Reeve, Associate Director - Sales, at Lowndos-Ajax Computer Service Limited, Milton House, Milton Road, Croydon CR9 2XG. Telephone: 01-689 2244.

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Amember of the fight Section of Security in the Care

Special travel arrangements to the international **Electronic Components** EXNIBITION (Paris)

IPC Electrical-Electronic Press

Ltd., tha warld's larges! publishars of computar electrical and electron journsis, have mada spaciel errangamanf lor readars wishing to visit the international Elactronic

Exhibition. Tha

cost includes - trevel by schaduled elilina from Haathrow * first-class hotel eccommodation * arrival and daparture ironsfara * ad mis to the Exhibition

*services of an maneger. Tha progremma A CAME BUILDING comprises the following tours.

The tour comprises of flight by scheduled striling to and from Paris (Abrit 2-4) 2 nights accommodation at the Price par person from £139,00

use of free-form procols, as advocated here, saems to have sevarel adventages; particularly eandardised, a hardware parsar how that intelligant terminals designed to locate them on the with cheap storage and processing power are becoming avail, come a basic feature of future able, and where some owners systems.

Will wish to write their own local how doubt there are many different and the software. sing power are becoming avail, come a past sale and where some owners systems.

Alle and where some owners systems.

No doubt there are many diffective to write their own local in the flowing that have been over.

In such cases, the time taken looked in this rather brief distarble for every character, custom but the ideas proposed intelligent Territoria. EIN report.

which is the obvious objection are offered in the hope that they to this proposal, will be out will be a useful besis for further any implementation occurs. Tha weighed by the ease of work.

weighed by the ease of implementation. Furthermore, if the string delimiters can be etandardised, a hardware parsar designed to locate them on the first pass of the file could become a basic feature of future work.

**C"You don't know me, but my names is Derek Berber of the EIN Project, NPL Teddington, Middx, England, and I would be delighted to receive your comments."

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oxpertence in Sweden and by
States. The meeting will be higher
than the professor of the Official Sorte
17.00. Details tron the Six Ser. Management Services. The seminar will take the turm of last half-day events on April 4-5, and an exhibition has been organised in dispiny working examples of relevant equipment. Further information can be childned from D. Brook, 5 Hall AN exhibition end conference, on

on Shaugh 33680, John spongrafi event are Thomas velly laps Management Chief, as it to theke and East Berth Characters.

FROM Facsimile to Electron by title of a conference shall be be conferenced which is a conference of the conference of t

and Africs, is holding its meeting this year in Nijmegeri, Holland, from April 3-8. Spackers Include C. Machover, of Machover Associations; A. Vati Dem from Grows Uciversity, US; M. Sabin of the CAD Centre, Cambridge; and T. Sanche from Cambridge Applied Technology. The meeting will examins the past and expected future of computer graphics, and cost benefit aspects. Datille from The SEAS Headquartars, Togrnoolveid, 6525 ED Nijmegan, The Netherlands. Tel: 860 558333 ext 2783. AN exhibition end conference, on managing microprocessors, is to be held at the Holiday inn in Langloy, Berkehtre, on May 30. The aim is to assess the commercial and business possibilities of recent developments in microprocessing and microcomputing and to talk with leaders in the field. Those wishing to exhibit products or who require further information should contact P. J. Reynler FilTURE developments of the UNIX operating system will be discussed at a one-day conference to be hald on March 29 at the University of Kent at Canterbury, Brian Kernigbam will address the New approach to network protection • From page 4

AN ICL 2900 canversion can has been pwarded to Mercol Computer Services by en un-

EX-POST OFFICE Prestel marenable different Series 21 sys- and three others to form a

A TURNKEY property manage- nsss Basic and runs undar ment system has been developed RDOS. by consultants Fraser Williams (London). Based on Data the package has been the General hardware, it is available Weatharall Group of chartared in configurations ranging from a surveyors, which has installed a In configurations ranging from e single screan MicroNove to a . 96K byte Nova 3/D and 10

lerge Nova supporting severel Specially formatted scraens office: are used for all input to the sys- Prices range from shout tem, which is said to require no £15,000 for a On

former Lord Chencellor, was speculating on what would hap pen "if" a cantral computer stored such information de

on a central computer. formation does not go on a Doctors from a apecialist sub--computer, and is the subject of

National Computer.

plant to making equipment for mechanising the service industries, such us sutomatic fare collectors, for which there is plenty of

in Glasgow THIS week Compotermarket '79 starts its annual four-city toor o Britain at the Albany Hotel Ginsgow. About 77 exhibitors

the shows, about 15 more than last yenr. The emphasis is on the first-time user. Much in evidence are suppliers of minicomputer, and microcomputer-baseil systems, represented by firms such as Systime, GEC Computers, Data General and Commodore Systems, Willis Computer Supplies

are taking part in some or all of

showing a range of new fluppy In addition to suppliers of VDUs, data transmission equipment, printers and printing supplies, a great deal of business application software is being

is travelling to all venues and is

A £7,000 desk-top small business system for retailers and wholesalers is on show from Data General, Wang UK, at all but the tilasgow event, is de monstrating accounting, data entry and stock inventory pro-

Next week, the show moves to

the Albany Hotel, Birmingham,

from March 20-22, and then to the New Century Hall, Manchoster, from March 27-29, The final venue is the Bloom Shury Centre Hatel, London

Entrance to the exhibition is tree. For further information contact Conchinead 1 (d. 12) Great Windowll Street London WI Tolent 12 that

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PEOPLE AND EVENTS

Computer **Automation**

changes COMPUTER AUTOMATION has apprinted Martin Glazebrook-Sack as managing director. He succeeds Geoffrey Salkeld, who has become deputy chalman in addition to his position as vice-president of uropean operations. Glazebrook Sack was a founder director of Telex International, after working for nine years with IBM. Reporting directly to Salkeld as European financial controller is Christopher Birks. He joins Computer Automotion from Memorex Europe, where he was treasurer for Europe, the Middle

Bernard Lavelle, formerly produc-tion controller with Tally informeadminiatration monager for the

John Hayes has been appointed territory maneger, East Midlands, for Computer Machinery Company. He has worked for CMC's tachnical aupport division for the past three years, but in his new capacity he will be responsible for all sales in the East Midlands area.

Micheel Shecklady has become a development engineer with Dicoll Electronics, Selore joining the com-pany, he was control technologist with Mars, concerned with the design and development of electrical and electronic control systems. Shackiady, who has also worked for Roneo Vickers and RHM Foods, is an associated member of the British Institute of Management,

Gerald Fleming and Donald Pate have been made vice-presidents in internotional operations for Nor-Ihern Telecom Systema Corp. ming recently returned from London where he was ganeral manager of Dete 100 Corp's European marketing activity, and is now vice-president, marketing development. Vice-president, international distributor sales, is Donald Pate, who was formerly director of international sales for Sycor. He joined Sycor in 1971 ea a district sales menager and was later promoted to director of Far East mar-keting.

Derrick Maddern hes hoen oppointed sales manager for Tele-prioter Equipment of Tring. Ha worked for the sales and marketing division of Cable and Wireless for division of Cable and Wireless i the past 22 years.



Eugene Cronin has been appointed vice-president, Europe, for Documation Incorporated. He previously held the position of vicepresident of administration for the company, and in his new role will be resnoneible for the company's

Meurl Morin has been appointe by National Semiconductor as business unit manager for Northern Europe. He will be responsible for the company's sales and marketing operations in the UK and Scandinavia. Prior to his present appnintment he held the post of egionol manager for Northern California and Nevada.

Jacques Finet has become menager of the Peris centre of University Computing Company. Finet, who is a graduate in alectronic engineering, has worked for several years as a systema engineer with ICL in France. He has olso worked in the marketing aphere for SIA and then Franiob. In his new position he will be responsible for the business operations of UCC (France).

Len de Jager has been appointed senior technical support engineer for Compeda's team in Holland, He waa previously e project engineer with Shell Internationale Chemie Mij in The Hague, Joel Floraatinus, formerly with Crawford and Russell, has become a senior technical aales consultant. He hes also worked for Marconi end with the Control Systems Centre at UMIST, Menchealer.

Les O'Rellly has become director and general menagar of Eeatern Computer Services, Petarborough, Previously he wes production director with the company, and before thet was general managar of the retall division of Geest, the company'a pareni organization

Brian Dix has become managing director of Noiton Communications. He was previously managing direc-tor of Ultra Electronics and its associated company, Bribond

Dave Lowrence has joined Allison Computer Media as Southern aree manager. He was previously date centre manager with DP Advisers, the South London bureau.

DIARY

MARCH 19-21
IBM — the acut five years, inforcin
State of the Art conference. Hotel Softiel,
Parts. Contact Dave Sates: 0628 35031.

Paris. Contact Dave Sates: 0628 35031.

MARCH 20
Logic for databases and programs. R.
Kowalsti. BCS Formal Aspects of Computing Sciance Group. Polytechnic of Central London, London W1. 18:30.
Recont developments in point of sales terminals. IEE/IERF. Computer group. Royel Institution. Albemaria Streat, London W1. 10:00.

Visit 10 19M ISL Coshom. BCS Hempshire branch. IBM Information Services, Cosham. 19:00.

Mit. oprocessors — from the usor's

Mic. oprocessors — from the usor's point of view. Or E. O. Ashworth, IEETE. Leicester Polytechnic, Leicester, 19.30, CAFS. BCS Preston bronch. Blackburn Technical College, Blackburn, (9.30, MARCH 24) MARCII 21

Precilical privecy. Ted Cluff. IDPM
Central London branch. Pearl and Dean
Studio, Broadwick House, Broadwick
Street, London Wt. 18.00.
Systematics, Kit Orindtey, BCS Cobol
group. BCS, 13 Mansfield Street; London
Wt. 14.15.

Wi. 14.15.

The world of microprocessors.

European Study Conferences. Hydo Pork
Holei, London SWI. 9.00.

Vielt to Royal Sussex County Hospital.

ACS Sussex bronch. Postgraduate
Medical Centre, Eastern Road, Brighton.
10.10.

Mechonical handling ond sorting of mail. P. J. O'Doherty. IEETE. Water-loovilla Community Contra, Water-looville, Hents. 19.30. The micro revolution and Horizon, 'Tha

Chips ere down, BCS Menchester branch NCC Oxford Road, Manchester, 18.30, MARCH 21-22

IBM CUA Local authorities group. County Hall, Exetor. 14.00.

Dasigning the system for people. J. Dedda. BCS Wast Herts branch. Heath Park Hotel, Hensel Hempstead. 19.30.
The role of Isrge computers in the 1980s. Prof. F. Sumnor. BCS Welverhampton branch. Lecture Thesire C7, the Polytechnic, Welverhampton. 19.00.
MARCH 25.30
Vacation school. LEE. University of

Vacation achool. IEE. University of Oxford, Oxford, Register IEE Secre-

MARCH 28-30

Europeon Computing Review. Inforch. The Conneught Rooms, Lendon. Contact Dave Bates; 9628 35031. Achieving project plans, saminar, Association of Project Managers, Jersey, Details APM, 01-799 3182. MARCH 20-27

Business gamo BCS Nottingham brunch. Book teamo through Margaret Mosloy, Cripps Computing Cantro, Not-tingham University, Nottingham, 18.30.



Micheel Flynn has become general manager of the Magnetics division of BPC Sualness Forms group. The division was recently formed to market computer magnetics throughout Europe and the UK. Flynn was formorly employed by Pyral of Paris, where he was in-



"An implementor

dream."

Dr. Brian Ford, Director, Numerical Algorithms Group Oxford, England/Downers Grove, Illinois

volved in the manufacture and mor-

keting of computer magnetic pro-

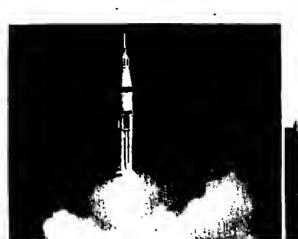
head the recently formed Avionics division of Cole Electronics. He formerly worked for ISM.

Fred Allen has been appointed managing director of Westrex Com-puny. Until recently he was the Howker Siddeicy group, as pro-duction director, and prior to that

By Judith Morris

IN racognition of his with satellite and space tedesia. Dr John Pierce has be awarded the fifth Mitteek ternetioner Fellowthip by Flarce, a professor by Glasering at the Cellionia etitute of Technology have granted more than 40 pages for inventions in electronic and communication decirch heatfard from Bell Labourden 1971.

The Fallowship was me. Ilehed in 1974 on the Ho end is administered by h



Power board

A DUAL ICL 2972 end e 2960 are

to replace the System 4/72 end System 4/70 at the South of

Scotland Electricity Board. The board will be making use of the nbility to use storege and perlpherals with the 2960 before

eing transferred to the mein

initially, the 2960 will be used

for program development and conversion. Some programs,

however, will not be converted

it all, but will ultimately run on

Among new epplications to be developed are a plant scheduling system and a terminal network

the 2960 under DME System 4.

to update

For the Numerical Algorithms Group, the plain-fact is this: *Software implementation was laster on the VAX-11/780 than on 25 other major machines."

Belore VAX, Dr. Ford's staff had implemented NAG's complex FORTRAN Mark 6 Library on 25 major machines ranging from minis to mainframes, including the Burroughs 6700, CDC7600, Univac 1100, and 1BM 370. The average implementation time was 13 man-weeks,

In Dr Ford's words: "The NAG FORTRAN Mark: is Library consists of 345 subroutines covering the major areas of numerical mathematics and statistics. It's used in applications such as structural design, nuclear physics. economic modelling, and academic research.



standard of the FORTRAN compiler, its main technical

the time shering service mor-kated throughout Europa by GSI. The in-house service to be

yet unannounced meckine to its UK customers rether then the IBM 4300 computers being offered to Continental clionts. Sut the Digital Equipment 2020 would definitely be offered here. GSI UK, fomerly CRC, seld that GSI in France had already started offering 4300s to cus-tomers there but pointed out that there were no plens to offer 4300s in the UK.

Mainframe change for

bureau's UK users

GSI, the glant French-owned

bureau group which intende to provide its bigger time-sharing cliente sil over Europo with in-house meinframe processing (CW, Merch 8) will offer on on

The other interest in the DEC 2020 in the UK was as a pos-sible replacement for the thros obsolete RXDS Signe 2s at

offered by GSI will be similar in concept to the Onsite service offered in the US and Europa by Autometic Oets Processing.
Onatta is a comprehensive package comprising ADP softwere and support and DEC 2020 herdwere, all provided by ADP os a complement to its time shoring service.

ation and file maintenance."

3033 from Itel 3033 is teken as 100%. According

Powerful rival to

3033 at lower cost in the form of the AS/6 Attached Processor. The AS/6 AP is rated at more than 4.9 mips, compared with 4.7 mips for the 3033 and 2.9 for the existing AS/6. The latter is Itel's Japan by Hitachi. more powerful elternative to the

The cost per mip of the AS/6 AP works out at about \$370,000, seys the company, giving it a

ta liel the comperable Amdahl

The AS/6 AP providea AS/6 users with an easy growth peth and like the AS/6 is built in itcl aiready offers direct

alternatives to the IBM 3031 and the 3031 AP in the form of the 'AS/5-7031 and the AS/5-7031 AP. Itel says that price/ performance figures of these mnchines ere between 70% and 80% of the 3031s. Their nilp ratings range between 1.2 and

Whila its AS/5 and AS/8 machince still beat their IBM counterparts in price/ performance, the AS/3-5, announced two wecks ago as a counter to the 4341 (CW, March 1), costs more than twice ns much to purchase as the 4341, mainly because the latter cumes with very inexpensive memory

hused on 6tK bit chips.
But Itel has adopted a pulley of offering the AS/3-5 on a short The rental on a 148, So the AS/ outperformed by the 4341.

who needs extra power now and cannot wait for a 4341 to be delivered.

Unlike the 148 the AS/3-5 more than matches the 4341 in power and Itel hopes that at the end of the short lease period many AS/3-5 users will agree to new retes which will be much lower and which will compare favourably with the 4341. In this way the AS/3-5 user could be persuaded to keep his AS/3-5 instead of renting a 4341.

Alternatively, the AS/3-5 user can purchase his machine from Itel at the end of the ehort lease period with a significant dis-

Itel can deliver an AS/3-5 within six weeks and provides MVS support with the machine, a provision which is not available from IBM with its 1341.

The AS/3-5 has a power rating of one min and has superseded the two original AS/3 ntachines and the AS/4. The latter was lense of 18 or 24 mnnths at Itel's original answer to the 148, charges that are 20% less than but like the 148 is drumatically

MP/200 uses 'half-card

of the Micronova microcom- the IC is contained on a 15 in x puter, the MP/200, introduced 15h hoard along with 32K words nst week by Data General (CW, March 8), is bullt around the same AMD 29011 series bit slice chlp set as the Nova 4 family announced late late year (CW. December 21/28, 1978).

est Nova 4 machine, the IC, p.

THE high speed bipolar version that the AMD 2900 processor in of memory, while with the MP/ hoard. The latter can be slotted into the 8-slot chassly used by the smaller MP/100 Micronova system, so that an MP/100 can The essential difference here he upgraded to an MP 200 ween the MP/200 and the smaller simply by replacing the approhe upgraded to an MP 200

Eurodata results to be held on infonet

study will be held on Infonet, the Computer Sciences Corp remote computing service, and be accessible via dial-up lines to the 17 European PTTs and the

Liveware Saga

WOULD YOU AGREE

I SHOULD SAY IT

WAS STABLE BY NOW

YES!

THIS TIME ...

THAT AFTER ALL

RESULTS of the 1979 Eurodata commissioned the study last yenr (CW, March 9, 1978).

Logica, which undertack the £1 million study, is now processing the information gathered from the PTTs and from Inter-

... YOU COULD CALL

CIRCUIT BURNEL IN'?

WELL, CAN WE SCRUB

TIME: THIS YEAR?

BRITISH SUMMER

THE STONEHENGE

VAX. Ask any user.

A successful implementation requires the correct functioning of the 345 library routines to a prescribed eccuracy and efficiency in execution of NAG's suite of 820 test progrems. Whilst the ectivity is a significant examination of a machine's conformity to the ANSI

Please send the your new VAX-11/780 colour brochure Please send me your detailed Technical Summary Please contact me []. Telephone My application is: Government Education · Medical Other * Leboratory : Enginaaring Sand Io: Tarry Clarka, Digital Equipment Co. Limited, Digital House, Kinga Road, Reading/Berks, RG1 4H4 Tel. (0734) 58 35 55

lealures are file creation, file comparison, file manipul-

"No problems were encountered in the VAX/VMS

new hardware and a new operating system."

And then there was the second of VAX reliability.

software even though approximately 3000 files were.

being handled. The operational availability time for the

machine was close to 100%, an outstanding statistic for

sophisticated FORTRAN routines in the world implement easily on VAX. That VAX capability exceeds that of

many machines far more expensive. That the VAX-11/780.

is more than the most powerful 32-bit computer in its

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What all this demonstrates is that some of the most

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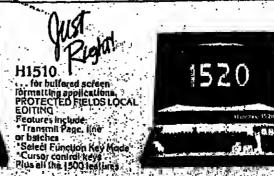














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Master slices the key to complex circuit definition

circuits of increasing com-plexity, as suggested by Intel prealdent Dr Gordan Moore, in his keynote addrsss to the international Solid State Circuit Conference (CW, Feburary 22), are stready being taken on by the big systems houses to a much greater extent.

One session of the conference was given over to one way in which the problem is bsing solved - large scale integration logic srrsys, or master slices.

These take the array philosaphy establiahed with the programmsble logic arrsy (PLA) and uncommitted logic array (ULA) a stage further, by committing to silicon an array of logic cells, or circuits, rather than the Individual devices of the PLA and ULA approach. By using a basically standard

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IOM LEACHES THE OLEGINSELS HOF ISTEL THUITANING

processors, peripherals and terminals.

for all who make use of computers, costs

sble to define the necessary interconnection pattern on the

Though not abla to fit all passible applications of microelectronics, the master slice approach does overcome many of the problems set out by Moare in his keynote address.

Baaically, he was saying that circuit definition for the general semiconductor manufacturers was becoming increasingly difarray, circuit designers are then ficult as the potential com-

Solid State Circuit Conference, recently held in Philadelphie, Pennsylvenie, USA, Micro News looks at the new generation of semiconductor devices, known as mester slices, that could make systems menufecturers preeminent in the semiconductor business.

IN this second report from the Internstional

plexity of the technology in-Though an ever-growing chip required to form the desired circuit configuration.

number of functions could be integrated into a single circuit, the greater that degree of integration, the lower the number of potential applications for any circult designed.

Only memory componenta utiliaed the full capabilities of the technology while remaining general enough in application to find wide market use

By standardiaing tha circuit deaign and processing as much as possible, circuits that utilised greater proportion of the available complexity were now pussible, while retaining an ecunomic design cycle, and still have only limited applications

Several companies presented papers on the mastar silce heme, including IBM, which has re-emerged in recent months as a leader in semiconductor technology from a period in which it looked as though it had lost touch with the pace of technological development in

IBM already has one master silce device in operation in its recently launched 4300 aeries eguloment. This is used as a peripherel controller in the 3880

The slice from which this controller is designed consists of 496 getes, organized into 74g logic cells. These cells, which are standard ECL circuits, are themselves organised into a 34 by 22 matrix in the centre of the 48,000 square mil chip, and are surrounded by 64 driver circuits and 8g receiver circuits on the

Between them, these realise 94 circuits are drivan by a + 1.7 volt

IBM's East Flahkill, US, plant, the devices are designed using the company's enginaering design ayatem. This is used not only for actual logic simulation and circuit design, but also for generation of the necessary test

routinea for the device. Design rules for the master slice appear to be loose, for the quoted geometries are line systams with a 20 MHz widths of 5 microns, and line frequency are possible using spacing of 6 microns, well below multiples of this master alice state-of-the-art capability.

in the manufacturing process, thaugh only three are involved in the design of a specific circult. These are all metalisetion layers, two being for personalisation of the circuit, and the third for I/O and power bussing.

in the application already operating an 87% utilisation of the available cella la achieved in the circuit design, and according to IBM this degree of utilisation The packaging of the device is

in a 115-lesd package using a ceramic aubstrate. To connect the chip to the subatrate, s solder-bump flip-chip technique is amployed, rather than gold

Another master slice device described at the confarence came from Japanese manufacturer. Hitachi. It has already manufactured a prototype line control unit using the circuit, and says that it is particularly sultable for fabricating peripheral control devices.

Using I2L technology, Hitachi'a master slice packs 5,000 logic gates into a 39,500 square mil chtp area. The slica is organised as 124 basic cell blocks surrounding two programmable logic arrays, which are used to configure the req-uired logic functions. Typical gate delays of 10 nanosecon are quoted for the device.

in the line control application, gste utilisation is 41.5%. Even with this relatively low figure the circuit, packeged in a 42-pin duel in-line peck, replaces 4i SSI and 18 MSI componenta previously needed for the applica-

An elternative design of mester slice wes outlined by Slemens at the conference. Though its chip, at 54,500 square mlls with 712 gates, is the bigprimerly constructed of two gest of the thrae devicas described, and hes the lowest gate count, the part offers a considerabia potential advantage by having on-board RAM as part of the slice.

Producad uaing the company's Oxis bipolar process, the davice can realise circuits that TTL-compatible I/O linaa. The sre extremely faat. Internal gate drivar circuits are driven by e delays of 500 picoseconds are +5 volt power supply, while tha quoted, while the 12g byte intsr-logic devices and receiver nal RAM offers a 3 nanosecond

An initial application deve-Already in menufacture at loped using the alice is a fully microprogrammable 4-bit microprocessor. This features a read-modify-write cycle time of 20 nanoseconds and an ALU offering three arithmetic and five logic oparations on two source operands selectable out of five input sources. The

operating frequency is 50 MHz. Siemens feals that 16- or 32-bit

Imsai's UK dealerships

THREE companies, including Epsom, point out that no com-Imsai, hava written to Micro, pany has exclusive dealerships News following the story on rights to the Imael renge in this country. Both of these companies sell the Imsel range puter systems (CW, Fabruary Imsel also pointed out that con-

Corner Computing Services of worldwide,

sidarably more than 50 aystems The companies, including have been installed in Europa, as computer Mart of Norwich, and mora than 13,000 heve been sold

ROM firmware for Apple II users

A RANGE of ROM-besed firm tape verification, tone genere-ware packages is being introduced by Apple Computers for its Appla II computer system.

Known as Programmers Ald, the packages offer capabilities such as light resolution graphics programmer of a wide range of utility gram renumbering and linking tasks:



By Martin Banks

entry system that can be expanded into a stand-alone computer, has now been introduced into the UK by its new exclusive distributor, Office Services of

stand-alone machine.

Though an extended Best to available, the main programsing in guarante in guaran Swindon. Based on the Zilog Z80, with the £2,700 18K bytes of memory, the £2,700 system comes complete with full compiletion of convent qwarty kayboard, numeric kay-pad, 40 character alphanumeric programe. It can also be used he forme generation.

with control chips

chips related to Intel's 16-bit 8086 micro. Together with the 8055 and 8059, the company hes a new bus controller known as the **£222**.

The 80g6 hes been criticised for being "too simple" compared with upcoming competitors from Mutorola and Zilog, but now intel's strategy is becoming

it has opted for a fast. relatively almpie centrel processing unit, produced in advance of other manufacturers, and surrounded it with e range of Intelligent peripheral control chips, which it claims, gives it a real throughput in excess of any

Only sketchy details are available for the 8222, which is spacified as a bus erbitration devica, linking eny other peripherei control chip to the intel Multibus. This minimisca CPU usage in

a manner similar to the IBM 370 channel controller. ligence" is linked to one central

As more and more "intol-

require a bus access at wartis the same time.

ECMA/Anel casents receive.
An RS 232C Interface allow

eyetem axpansion to produce

The 8089 is a high special ligent peripheral processor fast DMA capabilities, Effiities for its own meral bus. Typicolly, the 8222223 could be used as an interdisc controller.

All the initialisation route for the disc would be deal and by the 8089 rather than the 80 CPU, es well as mundant ba time-consuming details of heal positioning, track and sector control. The role of the CPC would be ilmited to high-leve commonds that would take for clock cycles. The third related chip, the

8088, should be the most power ful 8-bit micro yet. Essentially a 8-bit version of the 8086, this fcoturea 20-bit (1 Megabyte) H dressing and has the full & Instruction set. This 40-pin & vice, produced initially in a MHz version, will be available on carda which plug into intel

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Hungary offers a new mini

HUNGARY'S Videoton, respunsible for the minicomputers n the Rind unifled line of Comecon computers, has introduced o new model of its basic mini, which is hased on SEMS Mitra minicomputer licences. The new model, known as the ES-1011 or R-11, is n bit-slice micrnprocesor reimplementation of the basic mini, and some 50 have already been hullt.

Videtun exported 77 of its ministo SEMS last year, Exports of computers and computer equipment to the West totalle if million in the second half of

Energy management

SIX Systems Engineering Laborotories SEL 32 32-bit minicomputers will form the basis of a \$14 million energy management system being built by Westinghouse Electric Corp for Los Angeles City Department of Water and Power. The system will be designed to achieve maximum generating efficiency from the city's 27 fossil fuel, 19 hydro-electric and six pumped storage turbines. A similar system is to be developed In Scotland on a dual ICL 2972 (see page 11).

Russian order

THE British-designed and built ITT 600 AOX message switching system has won a significant contract in Russia. A £500,000 order for two 600 ADX systems, which are built round the Digital Equipment PDP-8 minicomputer, has been placed by the Primary contractor, Serck Controls, for use with the Orenburg manage the computer analysis

Canadian contracts

SCORING a significant breakthrough in the Canadian banking market, Philips has won Wo contracts for a total of 1,400 PTS 6000 tarminals. The Royal Sank of Canada wants 1,000 terminals, and Royal Trust

fax-Pak launch

ITT is expected to start a anonymous, will provide results wark in the autumn in the US. It

the formstion of CII-HB," says the company'a president, Jean-Plerre Sruié. In an interview with the French paper 01 infor-matique, he points out that the French public sector, nominally o happy hunting ground fur C11-H8, is not a monolithic entity.

fact that it is effectively shut off from the French

public sector market (see page 19), the national company Cil-Honeywell Sull la hungry for more

of machines delivered each year by 1980 is certainly

the most difficult of the objectives we set ourselves at

The objective of mstching IBM in terms of value

usiness at the expense of IBM.

Transplants

index

THE Common Market Commis-

sion is considering setting up a Europa-wida index for trens-

pients of human organs. This would snable surgeons to find quickly the most suitable racipients for organs that be-

The heed of the Com-

Bir, has carried out a study of suitable information ratrieva

that files on kidney transplar

patients throughout the nin-EEC countries be linked up.

eyetems and has recom

Contract for

votes results

THE contract to design and

system for the European Parlia-

nent election results this sum-

"There is not one public sector decision mokar but many," ha says. "Taking for axomple the City of Marsellics, which is not one of our enstomers (and is in fact un 18M user), it too is part of the public sector

puter requirementa over the period of the four-year sgreement established at the time of its foundation.

"Last year, we gained ground over IBM. We are holding our own in the commercial aector, but IBM has not done badly either, and I am not sure that we msde up much ground on them, and I certsinly don't think we have done enough to beat them in 1980." However, unlike commitments towards shareholders and employees, which he regards as obligatory, the "Beat IBM by 1980" is more of a challenge to the company us a whole.

in the interview, M. Sruie reveals that, like ICL, CII-H8'a expenditure on research and development is well above the industry average of 7%, and would amount to about 10% of turnover in 1979. In 1078 it was about 450 million francs, \$53 million.

He also reveals that the massively successful Level in the tenns of our agreement with the government — hut the decision is taken by the mayor himself, not orders running at 10% of the total taken by the company, valued at 300 million francs, £35 million

October show to avoid clash with Sicob

THE antleipated clush of dates between Sloob in Poris and Systems '79 in Munich will take place this year (CW. Septembe 4, 1978), but in a helated appreciation of the problems aused to computer professionais and exhibitors alike, the orgonisers of Systems have deelded tu restore the blennisi event tu October in 1981.

Nothing can be done about the clash this year: Sieob will take place as usual in the third and fourth weeks of September, running from 17 to 27. Systems will run from September 17 to 21.

This means that not only will the two shows by running at the sanie time, but that Systems clushes with the "professional" days which open the Sicub exhibition. As a result almost all those who normally attend both shows are likely to decide to go to Sicob as usual and give Ses Jenns a miss.

Perhaps worst hit by the clash are US minicomputer and peripherals companies which run lean operations in Europe ond traditionally bring over top US company officers for the major Europenn shows. Their imited resources will make it difficult to stage an effective display at both events, and they too are likely to decide to for sake Systems for the much larger and more international Paris show.

Computer professionals who ittend the conferences will also have to choose between the confunction with Systema.

EFTS goes on trial in France

small French town of Bourg-en-Bresse in the French Alps near the Swiss border. The experiment is being conducted by the 8anque Regionale de L'Ain Ain being the Oepartment of which Bourg-en-Bresse is the pletes the transaction, simul

VOLUNTARY compliance with

privacy codes of practice has begun in the US with tha an-

iouncament by Aetna Life &

Casualty Insuranca, that with

At present, 54 merchants are taking part in the pilot trial, ranging from supermarkets and poutiques to petrol stations.

Called MOA, for Multi Opératrice Automatique, the system is supplemented by 13 sutomatic teller terminals Installed at strategic locations throughout the town which enable all the usual withdrawal, osit, transfer and account balance checks to be carried out.

These automatic cash dispensers are IBM 3814s, similar to those currently being inatalled by Lloyds Bank in the UK, The revolutionary part of the

mer has been swarded to Software Sciences Belgium, aub-360g direct debit point-of-sala sidlary of the UK company with terminala in shops and storea headquarters in Farnborough, throughout the town. Thesa accept the same magnetic stripa cards as the 3814s, and enable The counts in each of the nine EEC countries are planned to customers to have thair start simultaneously on Sunday, accounts debited directly with June 10, for the first European the correct aum at the tima of elactions, and the system, which ia being developed on an international time sharing systam

The system will be available to will be called Fax-Pak and will all membars of the European allow communication between Broadcasting Union, and has facsimile been developed from scratch by Softwara Sciances.

whose owners wish it to remain

of the system, the bank is modestly equipped with an IBM 370/138 mainframe which runs the system and supports all the

ding the system to three other towns in Ain - Oyonnax, Gex and Lagnieu. • The system was recently fea-

tured on ITN's Naws at 'Tan on the UK commercial televialo network, where it was reported French EFTS experiment is, that although the systam had nowever, the installation of IBM rscaived wideapread acceptance, it was a comparative failure in the dress shops. Personal records open for inspection

As with the cash dispensers the magnetically encoded information on the card la read by tha 380g, and the customar then meric keypad ss a verification allow individuals to examine that he is the authorised holdar and correct their parsonal of the card. The computer then checks his account balancs and would be given to those turned if it is adequately in credit, com- down for insurance.

taneously debiting the cusomer's account and crediting Despite the ploneering nature

FIRST fruits of the Cil-HB P7G project to produce a successor mainframe line for both the Honeywell-Buil Level 64 and the The bank is currently extan-Cli Iris linea are due for announcement before the end of the year. The top machine in the line will offer twice the power of an Iria 80, which implies that it will approach the performance of the IBM 3032.

French Convention Informatique and tha congress held in

VALLANCES who know how to make the right connection switched to a Perkin-Elmer transaction processing system

Computer Systems Division 227 Bath Road Slough Berks Tel: Slough 34511

Graphics processing systems from Hitachi

TWO graphics processing systems have been introduced by Hitschi in Japan. The Hitsc G-710 is a microcomputer driven graphic terminal system for computer sided design, and the Hitsc G-730, plotured here, is a distributed computer graphic system.

The G-730 includes a minicomputer programmed in Fortran and in POET, Procedure Orientated Element Translator, which is an Interactive graphic processing language based on Fortran.

Both systems are designed for use by non-specialists, and simple designed for use by non-specialists, and simple designed for use by non-specialists, and simple designed for use the normal selection of, commands, and symbolic commands fissed on a graphic tablet.

Yorkshire electrical retailers foron-line order entry and stock control PERKIN ELMER

The new bigname in computers

nd of govt contract 'eview oard

HE Renegotiation Board, n US overnment agency that views contracts between rivate business and certain overnment buyers, is expected close its doors at the end of ie atonth after 28 years of scrice. One force said to be behind e demolition of the small but owerful agency is the pressure rom groups representing overnment contracts. A lastinute Congressional effort ould give the board a tempo-

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Other firms were assessed \$31 illion this year, which included naities for contracts involving companies.

Tiese actions, and others in e past, hnve angered ponents of the board, and it is icyed that these companies. nugh lobbying organisations. yed a role in its demise. Sovernment sources indicate

it some of the strongest lobing ngainst the Renegotiation ard came from the Electronics lustry Association, the chine and Allied Products titute and representatives of aerospace cumpantes.

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AMERICAN SCENE

BY HESH WIENER AND **CAMERON DAVIS**

Earnings rise, but the market falls

relations with China, inflation, recession and American politics has left stock analysts in an untenable position. A computer stock expert says,

"One school of thought has the market really dropping. Another has it rising rapidly in anticipation of improved corporate earnings. In other words, nobody seems to know what's going

The circumstances are indeed puzzling. Computer companies and the majority of America's large corporations are experiencing an extremely profitable period. Corporate earnings, which jumped upward during the last quarter of 1978, nre expected to remain high through the first quarter of 1979 and, for many companies, through ınid-vear.

Computer stocks have been sold lately, even IBM, which bobbed below 300 during mid-February, despite an impending stock split, the announcement of several attractive products and the expectation that the company would not be greatly affected by any recession that

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have slso lost value, in part be- is not yet known. For many cause of the general Wall Street attitude and in part because of ure in accounts. if the comthe chollenge posed by IBM's puters become worthless, or 4300 and Si 00 computers.

There is no queation that the could be similar to that of a fire market positions of computer or other dissster. compsnles will depend on their responses to iBM's price/ performance insprovementa. in the US. The paper value of a While IBM's competitors are typical system might \$100,000. resourceful, and have always Thus, with the announcement of responded to the glant's past the 4300 mschines, \$500 million challenges, there have been mo- on the books of American busiments of doubt among other-ness is leopardised. wise confident companies. The sale of RCA's computer business users' accounting will be and that of General Electric are revealed in coming weeks, as brought to mind.

Also in doubt is the state of various leasing companies, pro- mainframes on leasing comminent among them Itel, Conidisco and Transamerica. These companies may be forced to hold their computer stocks for write down the value of IBM systems now out on lease by a substantial margin, thus de- Important. creasing, on paper at least, their wealth and atability.

The effect of the reduction in values of mid-size IBM main-

information

DURING the 95th sassion of the US Congrass, 74 naw laws wera enacted that affect the nation's information policy. Few of tha laws, however, have information issues as their main con-

Abstracts of the new Information-related statutes hava been compiled in a report titled Information Policy: Public Lawa from the 05th Congress, released by the Committee on House Administration.

Congresamsn Charlie Rose, a North Carolina Democrot and chairman of the committee's Policy Group on information and Computers, sald Information policy was still an unknown factor in the legislative process. but that more than 1,500 leglslative measures wera introduced during 1977 ond 1978 which in-ciuded mandates for new com-operating company, Western puter systems or databases, directives for collecting or dissaminating information, calls for the introduction of new telecommunications systems

"Tha new technology gives us the opportunity to make befrer tinental Telephone Co, which use of information to improve

the quality of life and the quality WUI stock, to gain a controlling of government," Rose remarks. Interest.

NEXT target for that remorse; Fujitsu and Hitachi wera en-

less commercial machina, Japan inc, la tha US packaged applicstion software market, and t within three years the Japanesa will arrive in force.

This is the view of John Imlay, Jr. 1979 president of ADAPSO. tha Association of Data Proces-

a 10-day trip to Japan, where he should begin years, addressed 700 specialists at the within three years, Japan Software Industry. Through acquisitions, reciptoral agreements and joint venders.

tering the low end of tha mainframe market, which ambrocad that they had to have applica-

"As a result, MITI is to financa tha development of packages (CW1, Septamber, 14, 1978) With government support, Japanese productly ity and the launch of small computers, thay

More revelations on illicit phone-tapping

TAP, the underground society of phone phreaks, is about to wise secure circuits to the out. publish a method that is believed to open supposedly secret elephone circults to unauthorised parties. The forthconilng report, duc to nppear in the TAP newsletter under the byline of Napoleon Solo, describes a circuit protection technique called "guard banding" that has been used to prevent vandals with blue boxes and other Illicit gear from controlling inter-city phone lines.

According to Solo, switching computers that control trunk linea, called tandems, accept a 2,600 Hz signal only when that signal is mixed with nolae of another frequency. The 2,600 Hz signal is used to indicate that an iter-city trunk line is not in usc. That same frequency is used

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3.200 Hz signal, mixed with the

side world.

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AT&T says the circuits ate used by authorised telephone company personnsi to breat Into colls during emergenciera to test linea. AT&T sdds that the cloims of the phone phreaks an false or exaggerated.

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The guard band technique's also used on Autovon, the telephone network used by the US military. Access to Autoron by phone phresks has been previously reported, and misus was reportedly used during the Victnam war by phone phreaks to put soldlers in louch with friends and families, free of

Xerox aims to take over 74 laws on international telecoms firm

PLANS for a domestic data communications network, called XTEN, are still being pushed forward by Xerox, and the company is now aiming to get con-trol of an international record carrier sa well, WUI inc (CW, February 1).

aearly worthless, the result

There may be 5,000 IBM 148

sad smaller computers installed

The impsct of the 4300 on

obsolescence of smaller IBM

For Investors who expect to

some time, political uncer-

taintles abroad are much less

WUI operates international telex, voice and data channels, cablegrams, data communications and satellite services. WUI also owns Airsignal International, a radio common carrier.

Tha board of directors of WUi has already approved the proposed acquisition by Xerox, a deal that would be completed via a stock transaction estimated to be worth more thon \$200 million.

Last month Xerox and WUi filed a joint application with the Faderal Communications Commission for approval of the proposed pact. Such approval is Union International, and Airsignal International both hold FCC Ilcencas.

The takeover is also dependent on financial agreemant and and provisions for protecting stockholder approval. In-the mesntime. WUI has indicated it will oppose any moves by Conhas bought 13% of outstanding

Japanese package threat

sing Sarvice Organisations, and prasidant of Management Sciance Amarica Inc of Atlanta. His views were crystallised on a 10-day trip to Japan, where be-

Association.

In discussions I found, much tures, the time span could be be fer to my surprise, that there is no even shorter. There is no reason occeptance of application soft for them not to be successful in ware indicated the Japanese had fad all ware products, and their continuities supplication activate the patition will certainly betterin the tom written but now that their

first tima users, they realised tion packagas to sell their

Xerox chaleman and chief executive office, Peter McCirlough, says the impetus for acquiring WUI is to expand Xerox's market for coplers, the heart of the company's business. Industry observers, however, at over \$59 million, the CTE see much broader motives.

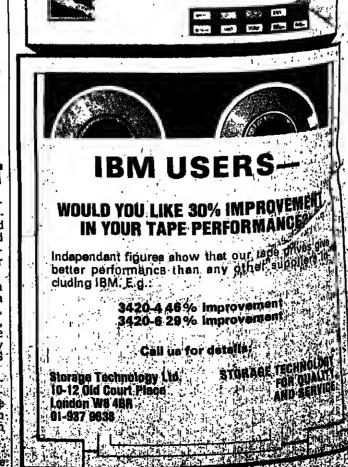
can link its copying machines into telecommunications nelworks anywhera in the world, as well as getting a share of the booming data cummunications market.

Furthermoro, Industry observers contend that by teaming up with WUI. Xerox and its proposed XTEN network would pose some pretty stiff competition fur AT&T and its planned Advduced Communicutions Service, and for IBM and its venture in Sotclite Business

Mennwhile, the FCC studying another proposed acquisition, that of GIFs hoped-for takeover of Telet-Cuntifications Corp. Value Telenet propossi is being With WUI, they say, Xerox examined by the FCC at potential monopoly in the telecommunications business is general, and the packet switch

ing market in particular. Amld rumours that regulatory delsys might jeopardise the deal, the comm lins promised "expedited" pr ceedings. GTE has told the that the Telenet desi must be cumplated by May 21.

Now, In addition to con sidering SBS, ACS and XTEN the FCC is faced with these is majur acquisition proposals.



EXPENSIVE AND LENGTHY PROCESS FOR WESTERN SUPPLIER

Breaking into the Russian market

By Michael Aldrich of Redifon Computers

MANY Western manufacturera

have looked longingly at Rusala and

Western supplier. The best way

in is probably to exhibit at the

many exhibitions organised by

the Expo Centre in Moscow, The

exhibitions are well attended by

trade organisations and end-

users from all parts of the USSR.

are completed through the

ganisations, the government run

specialists. These people are

highly professional in their

operations and formidable in

their negotiating expertise. As a

result, contractual negotiations

The Soviet Union expects

performance, is prejured to pay for it and it will not tolerate

mediocrity. Business dealings

are scrupulously fair and pay-

The overall business climate

in Russia is conservative. It

as a supplier. Computer acquisi-

tions are often planned years ahead so the Individual system

buying cycle is slow. When confidence is established, business

becomes predictable provided

that the supplier continues to

Soviet Union Is careful and

methodical. Its starting point is

the same criteria used by com-

puter buyers everywhere -

company stability, ability to

solve problems, growth poten-

tlal and future possibilities.

its follow-on position is more

Inscrutable: the qualitative

asues of local staff and organ-

isation, commitment to the

stamina to aatisfy demanding

Foreign currency is available

only for important projects

which inevitably are monitored

closaly from pre-contract to post-installation. Complete suc-

cess is tha major critarion. Thua

the Soviet Union looks for

acrosa-the-board back-up sar-

In practice, Soviet customera

adopt a policy of self-rellanca,

which is more in line with the

creative and Innovativa in their

and discerning customers.

terms and conditiona atc.

In evaluating suppliers the

ment is made on time.

are detailed and exhaustive.

All commercial transactions

WESTERN computer manufacturers have long cast envious eyes on the Russian computer market. By Western standards, the Soviet Union is heavily under-computerised both in numbers of systems and range of applications, but although the country is committed to large expenditures on computing, there is no potential honanza for Western suppliers.

The use of computers in Russia is tied to a plan that the whole spectrum of foreign recognises their role in making government, ludustry and services more efficient. That plan is bound into the growth of the Russian computer industry and appropriate foreign trade orthose of allied economies in Eastem Europe.

em Europe. import/export agencies staffed
Through the Rjad plan for a by technical and commercial naified range of East European computers and perlpherals, the USSR has access to most of the computing power it needs in terms of mainframes but less so in terms of minicomputers.

For the Western supplier, excent in unusual circumstances. there is no market for mainframes. Minicomputers are icing bought for specific appilcations, but as local supplies increase, they will follow the nath of the mainframes.

Hecause the USSR never takes time to become accepted embarked upon the widespread use of mainfrances as in the West, the use of multiple mini and microcomputers instead of mainframes receives synt. pathetic attention. Easy to use systems with Cyrillic software. keyboards and printers are being installed to replace. maaual systems.

Just as in the West, technical computer skills are scarce commoditles, and thus the attracilons of simple terminal-driven systems with fast delivery and juick implementation are sub-

In theory there is a market for large scale scientific mainframes of the kind produced by Control Data, but such sales are so beset by political considerations, rest-Soviet market, apares support, sll levels of aducation and nctions and the need for approvals, that in practice it is difficult training, literatura, reference manuals, and finally sheer to complete a sale.
Probably tha best marketing

opportunity lies with microomputers. At the Informtechaika exhibition in Moscow last month, mainframes were conspicuous by their abaance, inicomputers ware shown for particular applicationa, but croprocessors were in abun-

Of the major suppliers at the exhibition, iBM gave prida of place to a laser printer, Cil-HB hsd a graph-plotting Level 61/60, Burroughs diaplayed a Big and word processing aquipment, and Redifon, the only UK not over-demanding of support earlies. In fact, they are aasy to computer manufacturer present, had two large working R\$50 deal with and generally make excellent references. The largest value of the largest val The largest stand was that set up

ae of systems than equivalent The novel aspact of the exhibition, however, was the Westarn organisations. In markating computer ays-Presence of the major distributemain the Soviet Union it must tors of personal computars. be remembered that Soviet With their long history of innovative use of equipment dapolicy is to develop self-sufficiency, Education and insigned for other purposes, the Soviet Union could wall be attracted to the davalopment of dustrial strategy are geared to this and Tha Soviet Union does personal computera for business have, howaver, a continuing application use. The low cost and high technology transfer enefits must be attractive.

Markat antru in the tig itry in the USSR is expensive and langthy for the

need in different areas for Wastern technology. This need will remain as long so the technology gap exists. In the future, manufacturing licences may increase and ba-

Eastern Europe, hoping that as ara likely to be only for specific political tensions eased, considerapplications. Last month Radifon able marketing opportunitiaa would Computers was the only UK comcome more valuable than selling finished goods, Available hard

> Licences, however, sometimes have the unfortunate effect of

currency is better millsed building local industry than financing imports — a lesson that the British government could usefully learn.

bacome self-sufficient and orders

when the licensee decides to ex- in Moscow. The Games have port to markets previously supolled by the licensor. For this reason licences are becoming more restrictive in their marketing rights. For the next 12 months, the

trade environment with the Soviet Union will be dominated by the 1980 Olympics to be held

captured the nopular imagination and the anthorities are determined that the XXIII Olymplad will be long rememb-

puter manufacturer to take part in

the important Moscow show, In-

formtschnika 79. Here Michael

Aldrich, Redifon marketing direc-

tor, aurveys the Russian acane.

For the Olympics, the hest equipment available on world announcements shortly. The markets is being acquired. The business climate for British sys-Soviet Union is demonstrating tems is good

high levels of perception and acumen in selling advertising rights and driving hard bargains. Much equipment is being provided from Russia's home industries and from Eastern

Selected suppliers from the West will be installing computer systems specifically for the Ólympics. British companies age well threed, ICL has received the urder for two 2904s for the results systems (CW, February 221 and Redifon will be making



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End of govt contract review board

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Earnings rise, but the market falls

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cause of the general Wall Street companies it is a prominent figattitude and in part because of the challenge posed by IBM's 4300 and 8100 computers.

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Japanese package threat

More revelations on illicit phone-tapping

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Mike Loughlin, IPC Business Pross Ltd 14724F Pennshing, Housion Texas 77070, Tel.

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With WUI, Hicy say, Xerox telex, voice and data channels, can link its copying machines into telecommunications networks anywhere in the world, us well as getting n share of the hooming data communications The board of directors of WUI

> Furthermure, industry observers contend that hy tenning up with WUI, Xerux and its proposed XTEN actwork would pose sume pretty stiff composition for AT&T and its planned Advanced Communicaluns Sarvice, and for IBM and Its venture in Satellite Business

Meanwhile, the for studying another proper acquisition, that of Gir huped-for takeover of Ign Communications Corp. Vita: nt over \$59 million, the GI Telenet proposal is being examined by the FCC at potential monopoly is the telecuminunications businessi general, and the packet wild ng market in particular.

Amid rumnurs del regulatory delays might keeps dise the deal, the con has promised "axpedited" ceedings. GTE has told the that the Tolenet deal must

enmulated by May 21.

Naw, In addition to considering SBS, ACS and XIX the FCC is faced with these



EXPENSIVE AND LENGTHY PROCESS FOR WESTERN SUPPLIER

Breaking into the Russian market

By Michael Aldrich of Redifon Computers

MANY Weatern manufacturers

heve looked longingly at Russie and

Esetern Europe, hoping that es

political tensions eased, consider-

able marketing opportunities would

in is probably to exhibit at the

many exhibitions organised by

the Expo Centre in Moscow, The

All commercial transactions

phpori/export agencies staffed

specialists. These people are

highly professional in their

are detailed and exhaustive.

The Soviet Union expects

performance, is prepared to pay

for it and it will not tolcrate

mediocrity. Business dealings

in Russia is conservative. It

takes time to become accepted

as o supplier. Computer acquisi-

tions are often planned years

ohead so the individual system

buying cycle is slow. When confidence is established, business

becomes predictable provided

that the supplier continues to

In evaluating suppliers the

Soviet Union is careful and

methodical. Its starting point is

the same criteria used by com-

puter buyers everywhere -

company stability, ability to

solve problems, growth poten.

tial and future possibilities.

Inscrutable: the qualitativa

issues of local staff and organ-

Isation, commitment to the

manuala, and finally aheer

Foreign currency is available

which inavitably are monitored

the Soviet Union looks for

acrosa-tha-board back-up aer

vices and organisation from the

in practice, Soviet customers

sarvices. In fact, thay are easy to

Abova all, thay are more

use of systems than equivalent

hava, howaver, a continuing

need in different areas for West-

Western organisations.

and discerning customera.

cess is the majo

Its follow-on position is more

terms and conditions etc.

The overall business climate

are scrupulously fair and pay-

ment is made on time.

turers have long cast envious eyes on the Russian computer market. By Western standards, the Soviet Union is heavily under-computerised buth in numbers of systems and range of applications, but although the country is committed to large. Western supplier. The best way - come more valuable than selling expenditures on computing. there is no potential bonuage for

The use of computers in exhibitions are well attended by Russia is tled to a plan that the whole spectrum of foreign recognises their role in making trade organisations and endgovernment, industry and sernsers from all marts of the USSR. vices more efficient. That plan is bound into the growth of the arc completed through the Russian computer industry and appropriate foreign trade orthose of allied economies in Easganisations, the government-run

Through the Rjad plant for a lay technical and commercial anified nange of East European specialists. These people are computers and peripherals, the USSR has access to most of the operations and formidable in computing power it needs in their negotiating expertise. As a terms of mainframes but less so result, contractual negotiations in terms of minicompaniers.

For the Western supplier, except in musual circumstances, there is no market for main-frames. Minicomputers are being bought for specific uppilcations, but as local supplies mrrease, they will follow the path of the mainframes.

Because the USSR never embarked upon the widesprend use of mainframes as in the West, the use of multiple mini and microcomputers instead of mainfrantes receives sympathetic attention. Essy to use ystems with Cyrillic software, keyboards and printers are being installed to replace. perform. manual systems.

Just as in the West, technical computer skills are scarce commoditles, and thus the attractions of simple terminal-driven systems with fast delivery and quick implementation are sub-

In theory there is a market for large scale scientific mainframes of the kind produced by Control Data, but such sales are so beset y political considerations, rest-Soviet market, spares support, all levels of education and rictions and the need for approvals, that in practice it is difficult training, literature, reference to complete a sale. Probably the best marketing staming to actisfy damanding

opportunity lies with microputars. At the Informtechika exhibition in Moscow last month, mainframes wera conspicuous by thair absence, closely from pre-contract to minicomputers ware shown for post-Installation. Complete sucnicroprocessors ware in abun-

Of the major suppliers at the exhibition, IBM gave pride of laco to a lasar printer, CII-HB bad a graph-plotting Level adopt a policy of self-reliance, \$1/60. Burroughs displayed a which is mora in line with the and word processing aquip-ment, and Redifon, the only UK computer manufacturer present, had two larga working R850 deal with and ganerally-make DOP configurations with telecommunications networks. excallant references. The largest stand was that set up creative and innovative in their

The noval aspect of tha exhibition, however, was tha In marketing computer sys-tems in the Soviet Union it must presence of the major distributors of paraonal computera. ba remambered that Soviat With their long history of innovativa use of equipment designed for signed for other purposes, the Soviat Union could well be allracted to the development of Petsonal computers for business application. dustrial strategy are geared to this and The Soviet Union does application use. The low cost nd high tachnology transfer ern technology. This need will

ramain as long as the technology ensits must be attractly a gap exists.

Market entry in the USSR is in the future, manufacturing expensive and lengthy for the illenges may increase and be

become self-sufficient and ordere are likely to be only for specific applications. Last month Radifon Computers was the only UK com-

financing imports — a lesson that the British government - kering rights. could usefully learn. Licences, however, somethies

have the unfortunate effect of blowing back on the licensor,

finished goods. Available hard

building local industry than

trade environment with the Soviet Union will be dominated by the 1980 Olympics to be held

in Moscow. The Games have when the licensee decides to export to markets previously supcaptitled the popular injugitaplied by the llemsor. For this tion and the authorities are determined that the XXIII reason licences are becoming more restrictive in their mar-

puter manufacturer to teke part in

the important Moscow show, In-

formtochnike 79. Here Michael

Aldrich. Redifon merketing direc-

tor, surveys the Ruesian scene.

For the Olympics, the best For the next 12 minitis, the equipment available on world markets is being acquired. The

Olympiad will be long rememb-Soviet Union is demonstrating tems is good

rights and driving hard bargan vided from Russia's home dustries and from Easte Selected suppliers from t West (vil) be installing compil

systems specifically for t well placed, ICL has received t order for two 2904s for t results systems (CW, Februa - 12) and Redifou will be maki authorneements shortly. T business climate for British st

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MARKETVIEW

Last month, IBM's Deta Processing Division startled the industry with the announcament of the 4331 and 4341, which offer a dramatic mprovement in performance/cost ratio ovar the medium-size 370 models that they displaca in iBM'a catalogue.

Why is IBM being so generous and offaring its small to medium users so much

more power for lass money? Is it risking a drop in rentel revenues from 370/125 users upgrading to a cheaper 4331, and 370/148 usera upgrading to a chesper 4341?
In this Marketview, Fred Lamond explores

the strategic thinking behind the new anincoment, and the significance of some of or features, notably the System i PO/Es.

Why is IBM being so generous?—

WHEN IBM divided its computer marketing between the Dats Processing Division and the General Systems Division In 1075, GSD was given the task of broadening the IBM customer base at the low end, and DPD the existing 360 and 370 user base to defend and develop. As an autonomous profit censending a steodily increesing tre within IBM, DPD still wants

to grow, preferably by iBM's standard growth rates of 15 to 20% per year. But it cannot grow downwards among smeiler users because that is GSD territory, nor very far sideways into competitors' territory aince it aircsdy has between 80% and 70% of the world's general purpose computer market. Its only hope for long term growth thus lles in increasing the revenue yleld from its existing customer base, by persuading them to computerise ever more applications requiring ever more hardware and chargeable program

From this point of view, the growth rate of DPD's existing customers during the period 1975 to 1977 was far from satisfactory, especially in the amail to medium size systems range. To understand why, IBM appears to have commissioned a number of surveys, whose results have trickled out at various lectures

The aurveys showed that,

among large users at least, there is no shortage of new applications walting to be computerised. On the contrary, the rising younger generation of user department managers has grown up with computers. understanda better how they can help improve departmental efficiency and response and is

stream of requests for new DP applications to central DP de-It is these central DP departments that have been unable to keep up with the requests. Among the top 500 US corporations listed in Fortune magazine, the average delay quoted by DP departments for computerising a new application rose from two years in 1975 to four yeers in 1978 (figures quoted by Dr James Martin, formerly of the IBM Systems Research institute, at hia London seminar

last July). And the reasons why DP departments have been unable to computerise new applications as fast as requests were coming in is because 80% of their proammers' time was employed maintaining existing program suites, in large part to adapt their JCLs to the latest operating system releases, or as part of JCL conversion from, aay, DOS or DOS/VS to OS/VS 1. Programmer productivity la

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Warnier Program Design Workshop

thus the main bottleneck on DPD customer installations' growth, and DPD has devoted Its best brains since 1975 to finding ways of improving this.

One important oid to programmer productivity in the applicationa-independent database. By 1975, some of the most successful IMS ploneer users had found that on database oriented applications programs, maintenance dropped from 80% to 20% of programmers' time, thus leading in turn to a fourfold increase in the output of new

true of datsbases - especially IMS/VS - but also of the System IPOs, since these standar dised packages will almost always contain more SCP modules than any one individual user would require at any one

time of his working day, or ever. More main memory and/or backing storage has hitherto required higher rentsis or sn ditional purchase investment. It is in order to help its users break out of the vicious circle of

grammers the feeling of being demoted, IBM sales engineers might suggest to the DP manager that they be given the more challenging task of designing and implementing an applications-independent database, for which the instellation now has enough spare memory capacity and processor power.

The implementation of thot database will on past experience low programmer productivity increase the same programming

Fer from losing in rental value through its generosity, iBM's Deta Processing Division reckons on setting most of its smell to medium size users on the seme renewed growth path es its lerger users, from which it should gein meny orders for sdditional hardwere and progrem products in future years.

applicationa programs by the same number of programmers. Another more racent ald to customer programmer produc-

tivity developed by DPD is the System Installation Productivity Option (1PO) first offered on large 370/158, 168 and 3030 serias systems.

The trouble with both these productivity aids is that their use requires an initial investment in more main memory and/or disc backing storage, particularly by the installation whose resources are already

7-11 May

14-18 MB

21-25 May

28 May-1 June

.12-16 November

28-30 November

10-14 Dscembe

3-7 Dacambe

3-4 May

4-8 June

1.5 Octobs

8-9 Octob

15-17 Octob

and low applications growth. that DPD has now for the second time "given away" a substantial amount of additional processor power and msin memory for the same rentals as its users were paying. In 1977, It more than doubled

the power and memory available to 370/148, 158 and 188 users for the same price If they converted to 3031, 3032 or 3033 systems. Now it is offering three to four times the power and memory available at existing rentals to 370/115, 125, 135, 138 and GSD System 3 users if they convert to the new 4331 or 4341. In doing so, DPD is running

the risk that some users might prefer to usa the performance/ cost ratio improvement to cut their rentals rather than increase their configuration ower. But in the absence of the 4300 series announcement, such usera might well have deserted the IBM fold and ordered a cheaper Itel or other PCM system Instead. Sooner accept a ower rental from such users

than lose them altogether. Most IBM users will not react this way. Having, at equal power, consistently paid 20 per cent more for their hardware until now than other manufacturers' users for the sake of the additional IBM software and support, they are expansion rather than economy minded. and will prefer additional power and memory capacity to lower

Most small to medium 370 sitas, and some GSD System 3 users, can therefore be expected to order over the next two years 4331 or 4341 system with anything from 512K to 1.5M bytes more main memory capacity replacing. As soon as the system is installed, some of the additional msmory capacity will be used immediately to implement:

 DOS/VSE (which requires 160K minimum main memory residence) to replace DOS/ VS (96K mamory residence), A prepackaged System IPO/E which requires a minimum 512K processor in which to run, 1M If data communica-

database modules are in-DPD will also encourage 4341 users to move rapidly from a pure DOS/VSE to a VM/DOS/VSE System IPO/E, that will allow end users to use the DP system for personal computing under the VM Conversational

tions network control and/or

team's productivity fourfold Their greatly increased output of new applications will increase user departments' ond top management's goodwill to the DP department and - if they are an autonomous profit centre their revenue. This will soon enable them to afford to order peripherals from IBM to implement yet more applications.

Far fram losing in rentol revenue through its generosity. iBM's Data Processing Division thus reckons on setting most of Its small to medium siza users on the same renewed growth puth as its larger users, from which it should gain many orders for udditional hardware and program products in future years.

Nor are 370 users who huve rented or leased their systems operating system. They the directly from IBM tho only ones tn be considered. A large proportion of 370 users of nil sizes, ond oll the remaining 360 users. Internetive development of have elther purchosed their sys-. tems or are leasing them from o depurtment personnel, as well third-party leasing company. to interrogate a host system IBM has therefore already received frnm them directly or Indirectly oil revenue other than to sell dedicated 4331-ben mointenanco for their current

The 4300 scrios' dramatic improvement in parformance/ cost ratio will bring these purchasers and third must be supplied by the part of the supplied by the sup purchasers and third-purty lessors back into the market just os soon as their purchase costs

current leasing contracts have expired.

DPD has gone out of its woy o ease the path of thesa to ease the path of thesa purchasers and third-party lessors into the 4300 series market. It has done more than in the past to help them keap all their existing peripherals and attach existing peripherals and attach tems that could be s them to aither of the two new large corporations and at 4300 processors it offers and at tach them to aither of the two new 4300 processors it offers even an optional block multiplexer channel on the otherwise integrated adapter-oriented 4331 just to permit upgrading 360 users to keep their 2311, 2314 and/or 2318 disc drives and controllers, as well as an optional byte-multiplexer channel to connect any serial I/O devices.

Onca such ex-360 or 370 owners or jessors enjoy the benefits of a 4331 or 4341's greater power and memory capacity, they too will start using Systam IPO/Es, and be able to redeploy their systems programmers to themselves or research them to differ the too will start using Systam IPO/Es, and be able to redeploy their systems programmers to themselves or research the too will start using Systam incorporations and large corporations and large cor

their systems programmers to themselves of the second of t

Monitor System and its APL and IBM's Data Processing Divi of 19 a Basic interpreters alon has not designed the 4300 computer Use of a System IPO/E will series simply to succeed earlier find diffit immediately free the system System 3,360 or 370 processors programmer(s) for other work. The 4331 at least has been designed.

signed at least as much to be tions output from the sainc sultable dispersed or distribute processing satellite on addition team. But to save system pronnl sites within large corpustions and institutions, mostly directly in end user depart

That is why the 4331 has been

ments.

specifically designed to require no air conditioning if it is exequipped with the 84.5 M M disc drives and 8808 magnet tope drives. It also has a buildpower stabiliser to sllow it to be plugged into ordinary 13 am ring mains. Its integrated des communications scapler ut the backing ACF/VTAME gram product have been de signed to allow the 4331 take easily an online satellite swin tn a lorger host, as s small hot within an SNA communication environment.

lace as the 8100 Infomitie

other business minis.

it will have the advising

terminuls to be used for persont

computing in APL or Base or k

Cobni programs directly by

At n later date, DPD plens ab

"upplications machines", while

will be supplied by IBM pren

In this way DPD hope to a many 4331 systems through harge corporations and land

files interectively.

"IBM France is the only company within nur group which has o consistently favourable The 4331 will thus take it balance of payments with other companies within IBM Europe. and it has been that way for a System's bigger brother ut compete both with IBM GSD1 long time. Series I and System 38, and st

weekly Ordinateurs.

"Needless to say, it is impossible for all our subsidiaries to have a favourable balance of

at the imbalance between its

French and its other European

minufacturing operations (CWI, February 15), IBM Europe

president Jacques Molsonrnuge

returned to the subject in on

interview with the French

over its competitors of some program compatibility19 orger 370 or 3030 series series hosts, not only valle or RPG II, but also via la la. VSE job control language Lurger DP departments cont equip dispersed 4331 system with rendy-made application programs previously runding " the central system. Alternatively, dispersed illi systems can run under the best VM System IPO/E that support nnly the Conversational Mo tor System (CMS) and no gues allow any of their connected

> MAISONROUGE . . . 'a anrious problem for us."

exports to imports at the same time. But the fact remains that our business is growing faster in Italy, in the UK and in Germany than it is in France. So much so thst, within our group, France enjoys an even more privileged position in terms of value added sgainst busineas done.

This creates a serious problem for us. in Italy, for example, the government and the unions say we have a balance of trade deficit: It is necessary to build new factories, establish new research facilities. It is noteworthy that the main pressure on us from Italian unious is for more manufacture, premises. In fact, if a French

worries Maisonrouge elling its products to the, and he explained that in order to

mum is now 512K words, compared with in the UK, and also includes a microcoded

to establish a new plant south of in the interview, he also US government on the basis that returned to the theme of they are menufactured in Utica, government support for natio-nal computer industries. New York.

Federol government."

Major facelift for Réalité business system

system has been announced by France's live extension to main memory: the maxi-

lginsly based on licences from Microdats of 32K words on the supersceed model. Com-

iginally based on the Résilté-20 has been irvine, California, the Résilté-20 has been munication is slso greatly enhanced, with

reborn with major enhancements as the the previous 2780 communications protocol

Keeping pace with the general progres- X25 packst-switching lines for synchronous

comparable Réalité-20 model, and makes are of muitiple microprocessors as grammed in the proprietary "Francais," the

European president complains of unfairness

manufactura, we have decided

"We understand the French

government's desire, and that of

local data processing industry.

cluding a microelectronics

laboratory, which could easily

taken over by France at n

"It seems unfortunate that

after 12 years of support for Cll

and Cli-IIB, the public sector

closed to a company like IBM

which manufactures in France.

This inevitably reduces the work-load at the Montpeller

factory, which we established

there at the bidding of the

government in pursuance of its

work for IBM France, a com-

pany managed by French natio-

nals, manufacturing in France,

with a 1,300-employee research

establishment at La Gaude, and

the biggest French semiconduc-

tor plant in France at Essones,

are told, 'because you are IBM,

you cannot have access to the

a subsidiary of s US multinstlo-

nal, but it is also because we do

not happen to be the privileged

supplier which the government

has chosen to assist. Do not for-

get that C11-Honeywell Bull is

17% American. We do not think

It is fair to make a distinction on

the basis of the proportion of

French capital in the company

The contribution to the national

economy should be taken into

'Buy-American Act', saying that

the US government does not buy

any French producta, so it is

reasonable in raturn for us to buy only French products. But

this argument is based on faise

"People criticise ua over the

"It could in part be that we are

public sector market."

do not understand why we

Given that 21,500 Frenchmen

policy of decentralisation.

market in France should still be

facility and a research

time of national emergency.

But we have four plants, in

Rome," snid Melsonrouge.

sion of the market, the new machine offers communication, and a concentrator for four

more power at 80 per cent of the price of s asynchronous X25 lines.

number two minimaker Intertechnique. Or-

A MAJOR facelift for the Réalité business peripheral controllers, it also offers a mass- French version of "English" offered on the

supplemented with support for up to four

French policy on IBM still

In the interview, Maisonrouge also stated that it was IBM's polley to manufacture in Eurape other governments, to create a

get the same economies of scole as In its US factories, each plont series systems to agencies of the and each country had to products. He commented on the nced to keep European manufacturing costs os low as those in the US, end said that IBM was having some difficuleverything that was sold there, ty at present in achieving that. Priced at Dm 22,900, about

Microdsta Reslity and Roysle sold by CMC

Business Basic which is claimed to be very

The computer division of Intertechnique

has sold about 5,000 minicomputers since it

was started by its large electronic equipment

and instrumentation parent, and in 1978 dld

business worth about 181 million francs,

£21.5 million, including 104 million francs on

computer systems.

Computer Weekly international, March 15, 1979

Japanese PTT resists open tender pressure

THE Japenese public telephone company Nippnn Telephone and Telegraph is resisting pressure from the government to open up more of its equipment procurement to tender.

At present only about \$17 million of NTT's annual \$3,100 million expenditure on capital goods and supplies goes to non-Japanese companies end the criticisms of its enormous balance of trade surplus with most of the developed world, wants NTT to increase this fig-

efficient and fault-free phone system in the world, but i gnvernment pressure becomes Irresistible, open tender could provide unexpected possibilities for a breakthrough for Britain's

System X all-digital telephone

switching system. American compenies are, however, likely to be the principal beneficiarles, since the US government is spearheading tha pressure on Tokyo to relax

ICL 2956s for Papuan firm

order for Bougeinville Copper of Papua New Guinea. Underlining the success of ICL's DME/2 migration strategy gnt 2903 series users, tho mining company is to upgrade to the new rella's Great Barrier Recf.

THE remoteat ICL 2956s in the machines, introduced last world are likely to be the two on autumn (CW, October 10, 1978). from two 2904s. The machines will be installed on Bougainville Island, which is due cast of the moin island of New Guinea and 1,500 mlles unrth-enst of Aust-

Word processor from W. Germany

puter and small business system manufacturer Cumputer Technik Müller has introduced u stand-olone ward processor.

WEST GERMAN office cnm- £6,000, the system includes a processor, keyboard, minifluony drive, printer and operating software.

It is ilesigned to compete with

Memories are made of these Nashua Computer Products specialise in the manufacture of magnetic . To Frank Skinner Nashua Computer Products, Copy House,

media for the computer, and word processing industries. Products that are designed to the or exceed all known the signed to the distributions.

It is a factor to the line products are made of the signed to the signed

The Ring Bracknell, Berks, RG12 IET I want to know more about the Nashua range of computer! products. Please send me full details.

more research in Italy. company manufactures in the Franco-US deals completed

Two Franco-American dsals issued sharaa. And Matra of

initiated list yesr (CW, October Plottsr specialist Bengon has acquired the graphics division of Varian Asaociates, which now becomes Bengon Varian Inc. 1997 and 199 becomes Benson-Verian Inc and s 100 per cent subsidiary of the will be C-MOS expartise valued will be C-MOS expartise valued to the contribution of the will be C-MOS expartise valued to the contribution of French company, with Varian in at 48 million france, and the turn taking a 25 per cent stake io

Benson SA in tha form of nawly

100 million francs.

SWEDEN's national computer company. Datsaasb, has received a 7 million Krone order control ayetam based on dual Cansor 932 computers for the Stavanger control centre in nor weglan telecommunications and ministrations.

Norwegian ATC order for Datasaab

pertner in Gutler Cox end

Portners end hends the infar-

is the author of the Butler Cax Foundation reports on Dave

iopments in Deta Networks Torminal Compatibility an Public Dats Services.

The Foundation is

resoarch group which

examinae meior devolop-

mente in ita field - com-

puters, telecommunications

ond office outometion - a

boholf of subscribing

US govt settles on interface standard

ment has adopted an its required input-output Interface a atandard which la essentially based on the IBM 380

Japanese dispute pricing of 4300

THE hold-up in the announcemant of the IBM 4300 line in Japan (CW, February 22) ween IBM and the Japanaae Ministry of international Trade and industry over pricing of the machines. IBM sets a Japanese price somewhere between 1.2 and 1.6 timea the US dollar price in the US, and Jopanese sources believe that iBM wants to price the 4300a at the low end of the price multiplier while MITI wants the machinea priced at the high end to minimise the impact on domeatic Japanese

competition, with entries spread

the response from Wales and

Scotland has been low, so more

challengers are needed from

North of the Border and from

the Principality and the

South-West to ensure heats can

be held in those areas. This is the

last chanca to enter the coun-

try's biggest athletic contest for

computer people. Complete the

form below and send it with the

entry fee to Computastars, 117b

High Street, Croydon, Surrey.

Cheques should be made pay-

The contest is jointly spon-sored by Wright Air Con-

SCOTLAND.

well over the country. However,

made after December 13 thia year will be required to incorporate the atandard interface.

manufacturers, hesded by Honeywell, resisted the standard as reatrictive of competition end innovation, suppilera of piug-compatible and independent periphersi equip-ment are delighted with the decision, which they see as increasing competition in their sector of the market.

Commenting on the new standard, Bob Fertig of Advanced Computer Techniques, New York, declared it to be obsolete. "It should have been paased 10 years ago, when it might have been useful," he told mputer Weekly.

"Our Corporate Technology Committee has looked into it. and we find that the IBM 4300, although 370-compatible, has a government atandard is ineffec-

is going to be some tough com-

netition to win places in the finals at Crystal Palace.

The detes of most of the heats

have now been fixed and are as

followa: Midlands, Alexander

Stadium, Birmingham, April 8;

Thames South, The Sports Cen-

tre. Crawley, Suasex, April 29;

and North-East, Westcliffe

Mount Sports Centre, Cleck-

The dates and venuea for

Thanles North-Weat and East

Signature of meneger in charge of unit

Enclosed is £.... to cover the entry feee for men'e and/or ... women's teams.

The teem would like to compete in the following region: NORTH EAST NORTH WEST MIDLANDS SOUTH WEST EAST ANGLIA THAMES NORTH WEST THAMES SOUTH

In ell matters releting to the rulee and the competition, the decision of the organiser is final.

Please eend this entry form to: Computastars, 1 17b High Street, Croydon, Surrey Tel:

01-688-6690

heaton, near Leeds, May 13.

Last chance to

take up the big challenge

would like to enter . . . men's teams, woman's teams,

Chequee should be made peyeble to Computestere.

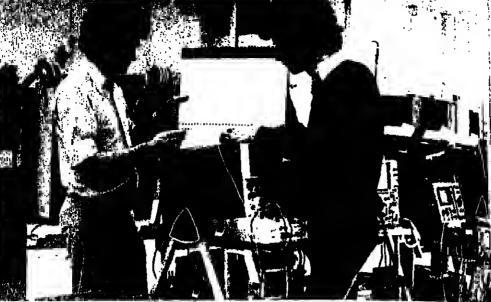
computer system procurements atandard is so watered down anyway that It is likely to be ineffectiva. For example, it excludes minis, but what is a mini? iBM 433i? System 38? It could While US mainframe hurt vendors dependent on go vernment businesa, particularly Digital Equipment with the

> ii00 and Honeywell." Underlining the irrelevance of the standard, Fertig noted that his group was expecting a new disc with the forthcoming top-end IBM H-series which would have double tha track density of the new 570-Magabyte 3371 disc

DECsystem 10 and 20, Univac

"The transfer rate of this would be so high that it could not be attached to tha atandard channel; I doubt if even the 3370

"The 370 channels were hardwired, but the channels on tha 4300 are 'soft,' which means that IBM can microprogram them, along with the controllers, for a new protocol overnight."



Amdahl's Irish assembly plant gets off to encouraging start

THERE are currently five machinea on teat at Amdahl's assembly plant in Dublin, shown above, and in company is planning to build 30 of its 470V series mainframes there this year. At present the Yar V/6 models are being built, but V/7s and V/8s will follow in June. Since production beganiss states 12 machines have been ahipped from the plant, which builds only for the European market and willer meet full European demand for some time. Amdahl currently has 26 installations in Europe state UK, aix in Italy, four in West Germany, where the company first opened, three in France theel.

Norway, and two each in Switzerland and Denmark.

it is noteworthy that despite they will come direct. Talke setting up first in West Ger- still continuing with Thoms many, Amdahi has not been about incorporating Thoms apectacularly successful there, memories in the hish-bi with only one commercial cus- mochines, which would fund tomer, which suggests that Sie- cut the duty on his-bimens may have difficulty in persuading many German IBM users to switch to Fujitsu's M. reached, series, renamed for local consumption the 7,800 line. However, Siemens' primary target is understood to be its own users who are outgrowing the 7.700

The Dublin plant, with 92 employeea and only one depar-ture so far, plana to be employing over 200 by the end of the year, and over 400 once its new 90,000 square foot plant under construction at Swords, County Dublin, is completed.

Much of the work in Dublin is still final assembly and test, but the consoles, incorporating n Keronix minicomputer and fixed disc, and the power framc assembly are now manufac-

Even at Sunnyvaie, Anidniil still puts together machines including aome moduloa ninde in Japan by Fujitsu, and some machines are atill built ulmost entirely by Fujitsu; in total, Fujitau catimatos that it still does 50% of Amdahl manufacture. At present all Japanese tricity, post office and manual assemblies come to Ireland via strikea have caused us differ

machines shipped with t

Amdahi reports titik rates are much lower e-boards assembled in Duk: in Sunnyvale, and Harry! ler, who heads the list of tiun, is enthusiastic about trish workforce. "The labour force is excel-

und they have been st trained," he says. "Worker in more willing here than in Sun nyvale, where they can alw get another job across the ros Labour costs are siso lower, bu nt this stage, so is productivity

The major shortage is the highly trained systems less large general purpose computers, sometimes with datapeople; we need people with fi base, always with mass storage. The purpose of the network is both to distribute and manage to 10 years' experience on IB are all coming from the UK. If the training graduates here, but it will take time. lodustrial between the common time. the information which is exchanged between these users, and the shared facilities which velopment Authority training grants are vital for this." they call on for services.

According to Mueller the higgest problems so far have related to public utilities. "He Sunnyvaie, but in the future ties," he aays.

the heats to win s place in the final except last year's winners. **Conditions of entry**

Anglia have atili to be settled.
The South-Weat heat will be at the Whitchurch Sports Cenputer staff from ony campeny ar organization involved in the davetre, Bristoi, on April 22, and the Scottish heat will be at the Mealepment, supply or use of computer hardware, saftware or sarvices. dowbank Stadium, Edinburgh on May 20. Both of these heats

will depend upon sufficient

There is also the possibility of

teams entaring in those areas.

an Irlah heat in Belfast. If there

are not enough taams for

women's teams of threa mambers

of the competition be employed on e full-time basis and ba totally costed to the unit, and must heve seen employed by the unit prior to We have read end accept the conditions of entry for the Computestars 79 competition end Jenusry 1, 1979. Contract and

> Data processing units with under 50 personnel may enter one men's and one woman's team only. Data processing units with 50 or mare personnel may anter a maximare personnel may anter a maximum of two men's end/ar two

heats, contestants will be invited

to take part in one of the other

All teams have to compete in

area heats if they wish.

lacetions may enter teems fram each losstion ar, alternatively, enter teams as e centrel unit. Once a competitor has competed for one tasm, fix or sha may not subse-

team, his or she may not subsequently represent any other unit or team in the competition.

All teams must be prepared to provide a marshel far all rounds in which they compete. The mershal may be a team member. The mershal may be a team member. The mershal in the running of the heat in which their team is a ampating. All expenses incurred by teams or their respansibility of the team or their section gives details of the characteristics.

eompany, All entries must be authorised by the date processing manager ar other responsible executive of the epmpany ar organisation con-

pete in the following region: NORTH EAST NORTH WEST
EAST ANGLIA THAMES NORTH WEST THAMES SOUTH

Computators of the competition, the decision of the organiser is final, the computators, 1 17b High Street Croydon, Surrey Tol.

The arganiser's legislon will be fine on all metting containing the second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the market or the drawing board, Another second on the drawing board of the second of the second of the second on the drawing board, Another second on the drawing board of the second on the drawing board on the drawing board of the second on the drawing board on the

Office automation aimed at professional staff, says report

towerda the use of terminels by logic failed." cessing units with split professionel ataff as well as by aecretaries and clerks, and towarda distributed micro-based systems combining word pro-

cessing and data processing.
These are the main findings of

word processing.
The report, "The Word Processing (Text Editing) and Office Automatic Market!" is 243 pages long and costs \$850. One section gives details of the characteristics. racteristica of existing equip-ment together with profiles of some of the 106 US companies

Lane, WI.

EUROPE'S largest complimate aervices company to a more based GSI group, a down not into Spain & is more spain a company spain acquisition of the spain to company to the spain to th

note pad, and logic falled.
Other reports on the subject that have been pour recently include those by and Simpaon Ranagrah Associates (available in the UK house the Wharton Associates mond) and by DC. might be added to IBM's definilion, is that of diversity. While the network structure itself must be unified and coherent, the devices attached may be diverse and often are, in Chiswick.
Frost and Sulliversity Loss
don office at the sulliversity of the sulliversi

one way or another, incompat-ible with one another. This incompatibility is the inevitable result of a-competitive
market and a rapid rate of technological advance, avoided only,
by those prepared to buy all
their equipment from a single French group to move into Spale

helr equipment from a single We can expect the devices connected to the network to include not only acreen and key-board terminals, remote batch terminsis, general purpose and minicomputers, which now con-

stitute the majority of the increasingly there will also be devices which handle text such as communicating word processors or images, like is simile transceivers, and even

By Anthony Gunton

manufs eturers, see The network

as the key component in avs-

tems of the future, providing

hooks on which they can hang

their peripheral products, and n

mesns of extending their sys-

is the problem of standards. tn

our opinion, intelligent net-

works are first and foremost a

way of introducing stability and

continuity into communica-

tions, on which more and more

formntion processing systems

Stability is threatened by

accelerating technological change and a highly competitive

Finally, and inculinbly, there

tenis into new market areas.

Networks can be a

reason why all these devices should share the same network is, quite simply, that the cost and inconvenience of establishing separate networks for each will be prohibitive, particularly when all of them produce

crucial weapon

in the armoury

munications networks can be

likened to the position of file

management aystems before the

ability to access, process and manage dats. Similarly, the cur-

rently favoured network

architectures promise to add, to

the spility to transport dats, the

opportunity to manage both the

network and the data which It

munications network in becoming an information handling tool

rather Ilian purely a transport

However, datsbasea are not

networks suit

for everyone; nor will these in-

everyonc. They will not be

cheap, hut those who implement

them will not do so because thay

save money, which they often

will not, but more probably be-

cause they make possible a bet-

The significance of

distributad proces-

sing, which is

modilying IBM's view

of the world es much if

not as rapidly as

everyone else's, is

that usars will often

have more power at

their elbow than tha

hence the centre of the network

The significance of distributed

processing, which is modifying

IBM'a view of the world aa much

f not as rapidly ae everyone

else's, ia that uaers will often

have more power at their elbow

than the ability merely to re-

quest services.
One other is

s s Isrge mainframe computer.

est services.

ter level of service to users,

If you like, the data com-

Datsbasea add to the basic

Considerable Interest has been generated in networking over the past few years, particu-Isrly by the success of Arpanet and of the value-added networks il spawned such as Graphnet and Telenet

However, it must be said that succeas has so far been measured in technical rather than

Packet switching, on which most of these intelligent net-works are based, is atill an expensive technology.

Let us begin with a definition. Typically, in an organisation It is now on the verge of demonstrating its commercial there will be a large number of users of information or of services. They may have terminal and, possibly, in the private devices or small stand-nione domain also, British Steel's experience with its internal netcomputers.
Then there will be shared work will no doubt be watched facilities, often one or more with great interest.

In fact whnt these packet switching networks do is nothing new. The airlines' Sita network, for example, has many of the features commonly associated with packet switching networks. So do the time sharing networks such as Tymshare's Tymnet and GE's Mark III. What is significant is that the

features of thase applicationability merely to raquspecific networks have been incorporated into a general pur pose scheme of great versalility large extent, from the multi layered structure which has been adopted also in the net

work architectures of the com-

puter manufacturers. Il is this that makea them complex in comparison with the previous generation of netvorks, using protocols such as This brings us close to an IBM IBM's BSC and ICL's XBM, and definition applied to its Systems also what givea them their Network Architecture (SNA): "a power and their ability to cope inified network structure deveoped to support user requests with today's systems, where an increasing veriety of devices services." In the IBM world the source of most services and communicate in a more complex

> One can reasonably assume that any managament aervices manager would wish to have euch a tool at his disposal. Wha then are the issues which need to be resolved before an intalligent network will be a practical

Firstly, the enterprise end the attitudes of the PTT, reflected in tariff end regulatory policy, will have a profound impact.

This is too larga a subject to do more than touch on here. Suffice it to say that PTTs have the power to determine the pace that modern networking techni-ques are taken up and also to determine who can participate — whether it is only the large organisations who can build their own network or everyone with a network problem.

No less important are the other established suppliers of data communications products. the computer manufacturers. Their network architectures promise the user a new level of

capabilities.

Will this be realised, or will we see another round of defensive in fighting, in which each subplier's main objective seems to be to lock his useff in rather than to solve system problemants.

It is clear that many suppliers. minart Beisteilft fettefele fibrit fent

The siternotive is the rather

market, both the comprehensiveness and the effectiveness of which would be open to doubt. intelligent networks, public or private, will not take the hard work out of information proceasing, just as database manage-

meni aysteins have not taken

habhnzard de facto standards

which will develop in a free

market, but is n prerequisite if skilled resources, already in short supply, are to make any-thing of the opportunities which technology opens up.

this, it can only be through the medium of widely-recognised standards! These atandards must be both comprehensive enough to encompass the variety of tasks which the network will be required to perform, and also precise and durable enough to remain effective.

If networks are to achieve

The Foundation trensmit ite findingo to members in three principal ways: as regu lar written reports, through management confarences and through professional and technical seminers.

members.

the hard work out of data pro-

REPORTS FROM

lo beed on reports made by

the Butler Cox Foundation

receorch group, which examine a variety of topice

releting to the development

and use of Information tech-

THE FOUNDATION-3

those who have invealed in ecome true of networks.

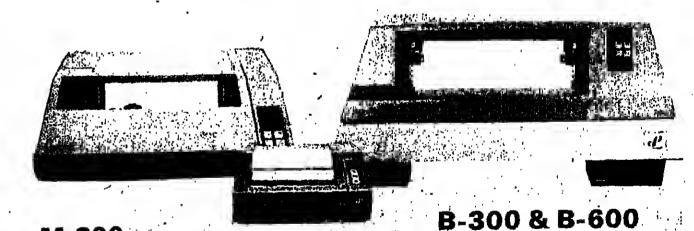
Undoubtedly, there will be a ong learning process, as there has been with database, but for those who persevere the

Perhaps the most important of these will be the ability to spend more time on user problems and less on purely technical difficultios of logistics, compatibility

For the management service department, the network can be a crucial weapon in the armoury, in a battle which is being waged on a fast-widening

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INTERNATIONAL **NEWS IN BRIEF**

CDC partner in India

AN OLD Madras-based planta-tion company, A. V. Thomas, is to be Control Data's partner in marketing computers in India.
Although CDC hns had a 3600

at the Tnia Institute for Fundamental Research in Bombay since 1964 (CW, August 1, 1974) it is one of the last US mainframers to announce a formal ink with an Indian company to

Swiss first

the Cantonal Bank of Schwyz, Switzerland, It replaces an NCR century 201 and will support 58 terminals at 21 locations.

SA subsidary

MEMOREX is running down its The language can be an subsidiary, in South Africa and existing one, a development of its products are to be distributed an existing language, or comthere by the former subsidiary petely new. of Computer Reaale Brokers, South African Computer Resale Brokers.

New Robotron mainframe on show at Leipzig

HIGHLIGHT of this year's Leipzig Fair in the German Democratic Republic is the new Robotron ES-1055 mainframe, the largest machine currently available in the Eastern bioc's Rjad unified range,
The fair, which has been running all this

veek, is the most important showcase for the East German manufacturer's computer products, and Robotron has been taking full

The ES-1055, which has a specification and the database management system, calaimost idantical to that of the IBM 370/148.

memory, is nevertheless claimed to be closer to the 370/158. The company has been demonstrating a railway seat reservation system developed for the Deutsche Reichsbahn and the backing and magnetic ledger cards, the 1720, railways of other Comecoa countries, which

weil as seats. standard Riad DS/ES, with enhancements, led DBS/R, is understood to be akin to IBM's

- systems portable over a wide out at about £60,000, and will

range of different and incom- involve four people full-time,

patible types of hardware, and with 15 others being called in on

would be aultable for developing . a part-time basis over the nine a broad spread of different months.

computers has been the most successful GDR computer product in Western Europe, with magnetic ledger cards, and the 1711 Involcing machine. handles conchette and bed reservations as

The 1711 is a micro-hused system with 512 The operating system on the 1055 is the bytes of control memory, and 16 words of user memory, controlling nn electric typewriter. The K1000 series is a line of micro-computers which use LSI MOS semiconductor processor and memory circuits.

China orders communications equipment

DIGITAL pulse code modulation microwave communications equipment has been ordered equipment has been ordered from Nippon Electric by Chins. It will be used in monitoring end controlling hydroglectric power dietribution end irrigation, end in flood prevention, in the crea between Peking. Shenghal end Wuhan. Up to 480 chennals will be provided over a 2,500 km route.

Japan's Ministry of Inter-

Japan's Ministry of Inter-sational Trade and Industry is planning to seek special oppro-val for the deal from CoCom, which monitors Wastern ex-

PoS increase

DURING 1978 the number of NCR supermarket point-of-sale systems in the US with Universai Product Code scanning in-creased from 50 to 224.

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According to Gerald Murph manager of the Property has rance Loss Register, this short help reduce the estimated in million that arson costs USE surance companies eachymz "Arson for profit has make

epidemic proportions, hesp awarded a \$1.1 million and to design and install these

Telax: 547335

Common Market ESL contract awarded to Siemens and CII-HB

The contract fails into two

parts. The first calls for iden-

tification of the required cha-

racteristics, supported with

the requirements of the prin

cipal potential users of the

The second part of the con-

tract involves a search to deter-

mine whether such a language

exists, and to decide whether

development of an existing

language or creation of a new one is the more promising line of

The contract is worth 89,000

evidence gained from evaluating

THE nine-month study contract—age which could be used to write—units of account, which works for the European Systems Language, ESL, has been awarded by the EEC Commission to a joint team from Siemens and Cli-Honeyweil Buil.

FIRST Swiss order for dual-processor V-8590, currently the largest NCR mainframe avail-which can be used for writing The requirement is for a able for delivery, has come from system software - specifically things like database management systems and information retrieval systems (CW, August 10,1978). Examples of existing languages of this type are DEC's Bilss and Bilss-32 (Software File, October 1978), and NCR's SWL.

The contract requires CII-HB one is the and Slemens to define the characteristics required in a langu-

£850,000 order from Libya

CII-HB's experience with its

own LIS language was a

qualification for award of the

contract. Team leaders are Herr

J. Teller from Siemens and MP

Douspis from Cll-HB.

THE biggest contract for CMC-UK, the Hemel Hempstsed-based subsidiory of Microdats of California, has been swerded by Libya's Public Social Security institute. Worth £850,000, the order is for fivo Reality Roysle small business systems and for five kay-to-disc

The Royales, which are built sround Microdeta minicom-puters, will each support six terminals, and all the terminals and keystations will support both Roman and Arabic elpha-

One Royale and one key-to-disc system will be intelled in each of five regional centres. handling registration, contribu-tions and hanafits for about three million peopls.

Italian firm to produce **Zilog Z8000**

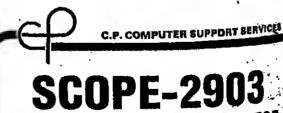
THE Z8000, 16-blt microprocesaor from Zilog is to have a European aecond source, foiiowing an agreement in principla for Italian company SGS-Ates to produce the device.

SGS, already on accord source for the Z80 micro, will be

aupplied with maaks, test data and other technical information by Zijog for the production of the Z8000 CPU chip, plus the memory managament chip, a FIFO buffer memory, a counter and parallel I/O chip, a serial I/O chip, a-buffer unit and a univeraai peripherai controliar.

Also included in the agreement is SGS' rights to second source the single chip Z8 micro-computer. Zilog is due to begin sampling of this part during the second quarter of this year. aecond quarter of this year.

SGS will oot get rights to the
peripheral devices being designed by AMD as part of its
pwn second source agreement
with Zliog (CW, Septembar 7,
1978), but according to
European director Pepe Piedra
SGS will not go short of these
components.



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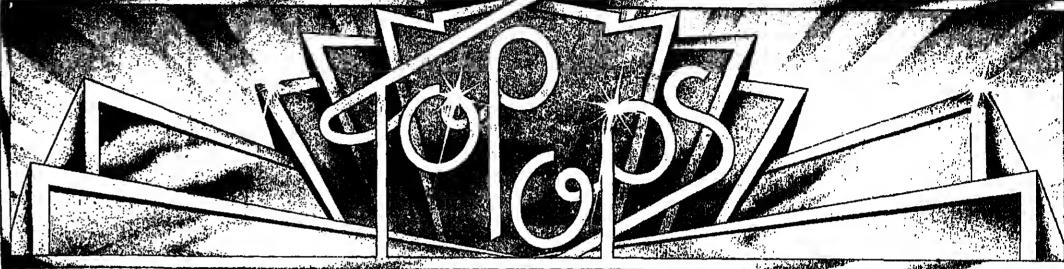


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Two permanent vacancies for top VDU ops are paying

Register now if you're interested in working abroad.

Dutch/German language knowledge very useful.

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days only. Data control & job scheduling exp. pref.

Knight ere famous for handling contract staff, but we always have a large selection of full-time vacancies.

Phona write or coli in and chai to Elaine Collis or Sally Oliver

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PIX REMOTE COMPUTING FACILITY. For details call Steve Goodwin on 01-890 1477 Ext 35 or send advertisement. name and company letterhead to Data Communications Division EMI Technology, SE Labs (EMI) Ltd. Spur Road, Feltham, Middlesex.

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MYRIAD

MANAGER FOR PRE & POST SALES SUPPORT TEAM

£9,000 +

A Manager or Systems Consultant with experience of small computer installations such as ICL 2903, IBM System 3, or Burroughs B1700, is required to lead a team of systems and programming professionals functioning in a pre and post sales support role. The Company is able to offer unlimited scope in the small machine area and a progressive career path to managers currently restricted by the size of their installation, or the extent of their current activities. The position entails client interaction, project management and the technical and personnel development of the support team. Based in the City the successful applicant is unlikely to have less than five years' D.P. experience, and will have functioned in both a systems and programming role. The environment is exceptionally professional with project teams working to the highest standards. Conditions of 'employment are commensurate with a major operation, including relocation assistance where necessary.

Ref: A2/1503

DEVELOP SOFTWARE FOR COMMUNICATIONS **SYSTEMS** BERKSHIRE TO £7,000

With the ever increasing emphasis being placed upon distributed processing and remote computing facilities, data communications is now one of the fastest developing and most important spheres within the computer industry. Already established as a major force within the industry and an international leader in the field of data communications the company is now commencing development of the next generation of communications equipment. This will provide a "total solution" to communications requirements, and will make extensive use of mini- and micro-based software products.

At present we are seeking two programmers to join this new and enthusiastic team and work on sophisticated: communications software. A background in programming the PDP11 is sought, and experience of RSX11M is particularly relevant.

Excellent conditions of employment include twenty-four days holiday and generous relocation assistance, if required. These positions offer outstanding opportunities to work in one of the most demanding, and therefore most in demand, areas of data processing.

MANAGERS FOR SYSTEMS SUPPORT TEAMS

£7,500-£9,500

There are several outstanding vacancies at various levels for Systems Managers or Consultants, with experience of medium ICL 1900/2900 mainframe applications, now seeking a demanding role and positive career advancement to more senior levels of management. Initially leading teams of analysts and programmers the new managers will be responsible for a wide range of projects and development of applications for a variety of installations primarily in the City of London.

Successful applicants will be unlikely to have less than five years' commercial systems experience, together with a sound awareness of business issues.

The Company offers excellent conditions of employment with a starting salary and benefits making a package in the range of £7,500 to £9,500. Career progression, working environment and conditions of employment are excellent, with relocation assistance available where

Ref: A1/1503

MANAGER MINI & MICRO PROJECTS BERKSHIRE CIRCA £8,000

The power and versatility of today's mini-computers and micro-processors, coupled with the development of sophisticated and reliable data communications is opening up exciting and unusual new applications areas within the data processing industry! One of the most interesting of these applications is the use of the computer as an intelligent tool in the management of data networks, and at present a Project Manager is required to lead a team initially working on the development of igust such a product.

State-of-the-art software development is a very demanding role. The person appointed will need the ability to guida a team in the development of entirely new techniques, and should be able to offer a sound mini and/or: micro background incorporating experience of RSX11: M, and communications protocols.

In addition to a good commencing salary, a range of fringe benefits including 24 days holiday and a comprehensiva relocation package is offered. As a major force in a rapidly expanding sector of the computer industry, the company provides a rewarding carear at the forefront of computer technology.

Ref: SW2/1503

MYRIAD APPOINTMENTS LIMITED 30 Fleet Street London EC4Y IAA 01-353-0981

Ref: SW1 / 1503

MYRIAD

PROGRAMMERS PROGRESS TO ANALYSIS

N.W. LONDON

£5,000-£7,000

An excellent opportunity has arisen for programmers wishing to progress their careers within the systems development division of s major international organisation. Our client is looking for persons with good commercial experience (preferably gained at an IBM installation) who possess the personality end initiative to become effective systems analysts. Formal training will be given to the successful applicants who will join system teams to develop and subsequently implement a variety of applications, some of which form pert of complex, multinational projects.

Additionally, the systems analysts will be responsible for pro-

ducing business proposals, preparing cost and benefits appraisels, estimating project requirements end meinteining instelletion standards. The more senior persons will lead e team of enalysts, reporting on progress whilst controlling the quality of work

The company, based in modern offices on the outskirts of London, offers impressive starting saleries and very attractive career prospects. Employee benefits include generous relocation expenses, pension/life assurance scheme and a staff restaurant.

PROGRAMMERS FOR OPERATING SYSTEMS & COMMUNICATIONS

Near HAMMERSMITH

DUAL ICL 2960

Our Client has now completed the installation of a dual ICL 3mb 2960 configuration initially running under both DME and VME/B with two communications processors controlling e TP network linking regional offices throughout the UK.

Two excellent opportunities now exist for Programmers with a minimum of one year's commercial programming experience who wish to gain veluable expertise within the extremely rewarding ares of Software and systems programming.

TRAINEE VME/B **TECHNICIAN** £4,000-£5,000

The Treinee VME/B Technician will receive comprehensive training in 2900 Operating Systems in order to provide the most of VME/B end Applications Systems, the successful cendidete will assist in tuning the system and play en ective role in the introduction of new fecilities. This vecancy provides en outstending opening for a Progremmer with approximately one. year's commercial experience to be trained in VME/B and embark upon e career in systems programming.

VME/B CONSULTANT £6,000-£7,000

This is an ideal position for a person with eround eighteen months expenence of VME/B to become e Senior member of the technical support eree within the installation end also gein extensive experience in the company's communications network. Responsible for a small team of technicians the person eppointed will supervise the operating system and TP network linking regional. offices. Candidetes should have et least four yeers' DP experience and be keen to pureue a career in technical programming. Com-munications experience would be an advantage but is not essen-tial since full training will be provided:

The Company is a major British organisation with diverse interests in industry and offers excellent conditions of employment and a

MYRIAD APPOINTMENTS LIMITED 30 Fleet Street Landon EC4Y IAA



SYSTEMS ANALYSTS AND PROGRAMMERS BEDFORDSHIRE

Major database applications

We have been retained to recruit additional systems analysts and programmers by a progressive and wellknown organisation based in 8edfordshira.

The data processing department is well established and fulfils a contral role in providing assential control systems and management information covering all aspects of the

company's operations. The installation is a medium-sized IBM 370 and DL 1 and CICS VS are already in use in key areas of the company.

Major new projects are to be developed making extensive use of database and involving additional teleprocessing including links to remote locations.

Applications are invited for the following positions:-

SYSTEMS ANALYSTS c£7000

Candidatas should have 3 to 4 years exparience in systems development work. A background in programming would be useful but is not essential.

c£6000

These positions should appeal to ambitious young programmers who should have about 3 years COBOL . experience. Previous I8M experience is not necessary.

PROGRAMMERS

Previous database experience is not essential. Our client will give you invaluable training and practical experience in this key area of systems development.

Working conditions and staff benefits are first class and salaries offered will raflect tha qualifications, experience and potential of the successful candidatas. Generous relocation expenses will be reimbursed in appropriate cases.

Contact Ivor Norton by telephone or in writing quoting the appropriata reference at your nearest office. Interviews will be arranged at locations throughout the U.K. to suit the convenience of suitable applicants.

Ivor Norton Management Services Ltd Recruitment Consulting Division

52 Shaffesbury Avenue, London WTV 7DE, 01 734 8862 (24 hom answering service) P.O. Box 63, Conthall Tower House, Harrogate HG1 1TS, Tel: Harrogate 66628

TEESSIDE POLYTECHNIC Computer Centre

The Computer Cantro provides a computing service for the teaching, research and administrative work of the whote Polytechnic. It is equipped with a powerful Universal 1110 maching recently instelled which will support over 60 terminate and an ambitious range of graphics devices.

A number of addruunal posts have recently been established. Applicants are now invited to the following posts which offer on apportunity to join a growing team engaged on a number intressing developments.

Projects Manager

(Information and User Support) — New Post (8080-08702 (Including supplements)

To lead a lasm of Programmer /Aealysts charged with ensuring that good facthrical support for staff and soudents using the computing facilities is provided. The team is responsible in particular for all technical documents and user guides, for courses of instruction on the facilities for the programming advisory service and for general leason with the user community. Oeod expenses of computer supplications and a ready misses in helping others as userned. Some knowledge of the techniques of techniques of techniques of techniques of techniques of techniques.

Projects Manager

(Applications Programming) — New Poss £6080-£8702 (inskuding sepalemental

Candidates for the posts should postess a degree or similar level qualification in a

Application forms and further particulars from The Registrar, Teestide Polyrechnic Borough Reef, Middlesbrough, Cleveland, to whom they should be returned within 14 days

SOUTH DERBYSHIRE DISTRICT COUNCIL Do you have at least 2 years COSOL experience and feel your talents could be better employed by a move into systems analysis? If so, you may be the person we are looking for as:

PROGRAMMER/ANALYST £3,732-£4,632 ·

The Council is awaiting delivery of the very latest Honeywell Lavel 62 technology with 320K memory and 3 x 80 mb discs to replace its present 81/60. The successful applicant with be a member of a laam engaged initially on conversion to the new installation and thoraefter will play an important rais in daveloping new systems.

The Council's offices, which by early summar, will be shuated in a new purpose built block, are in Swadlincote e small town close to the Midlands motorway network and the citiae of Oerby, Leicester, Nattingham and Girmingham but within acsy reach of such scenic attractions as the Peak District.

In addition to a salary within the above range the Council offers an etrective relocation peckega. Far further deteils end an application form, telaphone Mr. A. G. Meakings on aurtan-on-trent (0283) 221000 or write to The Treasurar, Cauncil Offices, Midland Road, Swedlincola, Burton-on-Trent, OE11 OAH.

Closing date for applications 28th March, 1978....

CIVIG &

CONSULTANTS/ANALYSTS/PROGRAMMERS

Due to the past successes and growth of the Banking Services division of the City of London subsidiary of CMG, a naw Company has recently bean formed spacifically to concentrate on the data processing requira-

ments of the 8anking world. We shall shortly be moving to new offices in the City and ara looking for further quelified staff to share it with. If you want to join an already established, but relativaly small group of DP professionals and can offer a solid. DP background together with relevant busineea axperience we

would like to talk to you. We plan and expact a substantial growth rate, thareby rapidly producing opportunitias for promotion, so if you ara looking for a more responsible poaition now is tha time to act.

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Programmer/ **Analyst**

Marlow

On Company Survives Enquatment plays a vital part in the operation of the Tereoff Construction Group Based in Marines we operate our ICL 2904 with 3X EOS 30 DDE, YDU under notweak of intuitigent terminals are being transferred but the major companies operating within the

We may wish in straingthaur our sinet development team nurt may landking for in person with at least 18 months programming hard systems asportence in COBOL and 15UO 17TL inflaming for the latter can be arranged. The surcensual applicant must be capable of working on their own and preferably have some as

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Pleaso apply in writing giving brief calest and parson levels to



THE POLYTECHNIC, HUDDERSFIELD DEPARTMENT OF COMPUTER STUDIES AND MATHEM

SENIOR LECTURER or LECTURER (Two Posts)

opplications are invited for the above posts which are invited for the above posts which are invited are evelop the work of the Department in Computing The invited and diplome courses within the Department Involvement invited in piletions of computers in business and industry. Applications of computers in business and industry appropriate experience of all least one of the following and

JBA

Systems Analysts (Defence Project) Technical Authors (Software)

Our client, aeeks experienced Analysts who have been engaged on defence projects for a number of years, preferably involving machines such as the Hughes 5118 and 1116 mini-computers. An in-depth knowledge of JOVIAL.

The project work will be connected with an avionics air-to-nir guided weapons ayetem and a low-level rodnr detection system intended for o major ground

Long term assignment, first class salary and great apportunity to enjoy a high Cantnot: Mike Crenmer

Analyst Programmer Paris

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A well established banking and commercial troding company has a vacancy for an Analyst/Programmer to join o development group in Paris who ore responsible for commercial systems.

Applicanta must have a minimum of two years os an Analyst/Programmer working on occounting applications. Experience of minicomputers and online systems is essential, particularly the HP3000 equipment, Knowledge of French is desirable but not essential os assistance is ovailable for language training.

Excellent salary and fringe benefits for this opportunity to live and work

Designers-Industrial Systems

Our client, a amolt software group in a well established British organisation. have apportunities for Systems Designers to take responsibility for the

development of real-time applications. Candidates must have a programming background (e.g. ASSEMBLER, CORAL, RTL/2) and several years in the design of special systems using minia or micros. Project leader experience would be an advantage.

This is an excellent opportunity to work on advanced applications in a small professional environment but with large company benefits which include new offices, relocation assistance, free cur parks, etc. Contact: Jim Baker

Long term contractnal positions are available to Technical Authors or documentation orientated Programmers who wish to enjoy fiving and working in one of the most exciting capitals of Borope.

The work covers a voriety of asperts from user guides to detailed descriptions of softwore application products and operating systems. Knowledge of communications and/or distributed processing systems is porticularly Contoct: Mike Creamer

Systems Consultants

Newman Street, London W1.(based) range £6,000 -£10,000 +

LOGICA continue to expand their presence in the commercial systems. market (ns port of a very diverse £10 mill, business) and is extremely well known for the high level of expertise in problem solving.

Opportunities now exist for additional consultants who can show a solid allround d.p. bnekground encompassing both programming and commercial systems experience. Knowledge of COBOL or PL/1 and on-line techniques plus involvement with retail/diatribution/mmil order applications would be of particular interest.

Hardware background is unimportant - although IBM, or HONEYWELL, is porticularly useful. Versatility, flexibility and in-depth d.p. knowledge are the key factors we shall be secking. Cuntact: Margaret Stevens

(Micro) Compiler Development

N.W. Landon £5.000-£6.500

This small and highly successful systems house is commencing development. of a new compiler, designed exclusively for use on micro-computers in a realtime, on-line environment. The project line room for n junior programmer with 18-24 months mini or micro Assembler programming experience, and who has the personality to be able to linise with elients and customers. The appointee will be joining a term of outstanding talent, which is breaking

new ground in the world of micro-based business system and operating software design and which has forged an almost unique place for itself in the software market. An unparalleled career building equorimity. Initial salary will be negotiated according to experier

Contact: Andy Wright

For further information on any of the above vacancies please contact the approprinte consultant. If your qualifications do not match the above positions but you are seeking other apportunities please contact us anyway.

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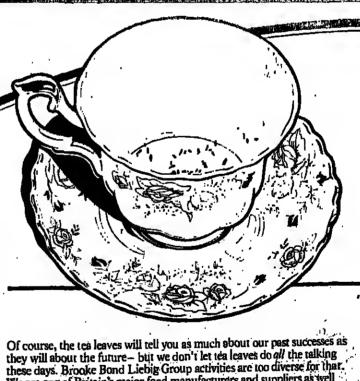
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anddates should heve & goed income dogree in Computer Cource and a lively interest in Yetome programming. An assing knowledge of the C professions are could be an dded advantage.

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Applications forms and further saniculars may be obtained from H. S. Clayton, Sanfor Assistant Registrar, The Registry, The University, Canjarbury, Kent C72 7NZ (Telephone, Canf., 58822 Ext. 263) quoting reference A 19 78. The diparty data is 2 April. 1978



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Walton on Tharnes. Our dual IBM 370/148s, running under OS/VS1, will

This, in turn, has meant even greater involvement for the Management Services team in 8 wide variety of projects for Group operating companies in the UK. Brooke Bond Oxo, manufacturers of many household name

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Systems Analysts and PL/1 Programmers

The progressive environment of our DP Centre offers challenge and responsibility and will provide plenty of opportunities to those wishing to realise their full potential. Systems Analysts will be based at Walton on Thames, or at our head office in central Croydon, and should have around 2 years' relevant experience. Programmers, with at least 18 months' commercial IBM experience, will be based at Walton on Thames and will be retrained if necessary.

Competitive salaries, according to experience, are backed up by the benefits normally associated with a major company, including relocation assistance where appropriate.

We'll like to tell you more about that rosy future. Meet us for a drink and an informal chat on Monday 19th March and Tuesday 20th March, between 12 moon and 8p.m., in the Curzon Suite at the May Fair Hotel, Berkeley Street, London WI (one minute) walk from Green Park tobe station)

If you can't make these dates bhone Vivian Fairhurs; Personnel Manager, on 01-686 8899. Or write to her at Brooke Bond Oxo Ltd., Lean House, High Street, Croydin, Stirrey CR9 HQ

Brooke Bond

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Systems Analysts

Career openings in a professional environment

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Our client, part of an international corporation, develops and manufactures high technology equipment for the communications industry. They are totally committed to the use of computers in every part of their operations.

Currently engaged in a programme of plenned expansion of their computer resources and applications, they wish to recruit ambitious systems analysts in work in small groups, developing cost-effective solutions in a wide range of commercial and manufacturing projects. They have sophisticated hardware, both mainframe end mini, using on-line, database and distributed techniques.

To take advantage of this career opportunity you should have a good educational background, followed by experience in data processing with a successful compeny end one year at least in a systems analysis role. You must enjoy challenging situations end have the social skills necessary to facilitate effective communication with users at all levels.

In return, our client can offer an excellent career path, enhanced by comprehensive training on the latest hardware and techniques. The benefits package is in line with major companies and includes full relocation and temporary occommodation if required. To discuss these career positions in more detail, contact Peter Williamson quoting

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ITT Business Systems are a supplier of communications systems for a wide ranga of customers throughout the U.K., Europe and many other parts of the world.

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To find out more please contact Frances Mason, Parsonnal Officer, ITT Business Systems, Diversey House, 1A Chalk Lane, Cockfosters Road, Barnet. Tel: 01-440 4141.

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The work will be mainly on a GEC4070 computer which is to be housed edjacent to the working in a number of application areas.
Applicants should have a degree and some experience in high level language programming, including FORTRAN.
Starling setery within the range £4000 £5900 Institute's central camputing system, an ICL 1903T aperating under GEORGE 2 and MAXIMOP. range £4000 £5900 : Generous holidays, and sick

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For turner details and appli-cation form phone or write to: The Employment Office Granfield Institute of Techna-

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To satisfy present expansion we have demands for:

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With a minimum of 3 years experience in commercial systems design and implementation, A programming background would also be an advantage.

Car allowance available.

Analysts/Programmers

Must have a minimum of 18 months commercial systems and programming experience.

Programmers

Preferably with at least 1 year commercial programming experience.

Excellent salaries, comprehensive benefits and attractive working conditions throughout the Company.

For an immediate interview phone (reverse charges) | Chris McDonnell or write to him with short career details at:

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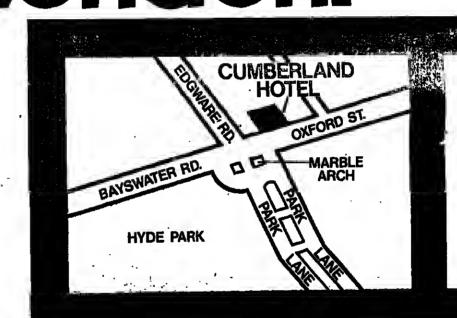
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Systems Staffup to £8,500 Senior Analysts

For project planning, co-ordination and leadership. Applicants should have 5-6 years' sound experience.

Systems Analysts

To handle systems design, implementation and maintenance.

Operations Staff £4,500-£5,500

Operators are required with sound experience on a large mainframe. A three shift system, five days per week, is in force.

What you do

Just call in to see us of telephone us on 01-262.1234

Programming Staff up to £8,000 Senior Programmers

Work entails participation in system design, program specification writing, quality control, and the supervision and scheduling of teams of programmers. Applicants should have around 5 years meaningful computer experience using Cobol.

Programmers

Must be capable of producing correct programs within an agreed timescale. Cobol experience is essential.

Support Staff

Required to work in diverse areas such as maintenance/support/audit of operational systems, quality assurance/support of development systems, evaluation of packages etc.

About the Company We are a very large and nationally-

known organisation, an absolute leader in our main field of production.

We are a Middlesex-based Public Company, near Heathrow, the M3 and M4. The D.P. operation is based on a

large ICL mainframe, involves a large number of mini-computers (including communications) and uses the TOTAL Data Base Management System. Because of future additional commitments, a complete review of hardware requirements is currently in progress.

For all these positions the benefits include free life assurance, a contributory pension scheme, subsidised BUPA and excellent free lunches. Relocation assistance will be given where appropriate. A Company car is provided with certain senior appointments.

If you can't make these dates

If you're interested, but unable to contact us during the interview period; please ring john Carter on 01-222 5734, who will then arrange a meeting at a later date:



Advanced Data Comms/Message Switch Systems Development

SCICON is a highly successful member company of the BP Group, with a growing international reputation for excellence in developing advanced systems and software. The Communications and Control Systems Division requires a number of high-calibre technical staff to augment their team in order to undertake an increasing volume of new orders and software

The division has eccess to a wide range of in-house mini/micro computers, including PDP11, NOVA 3, HP 1000, microNOVA, Intel, and Zilog. Tha computer room and micro-development workshop offer scope for those who relish a hands-on environment.

Professional staff are required in the following categories:-

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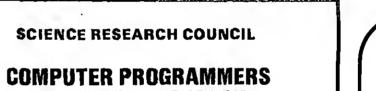
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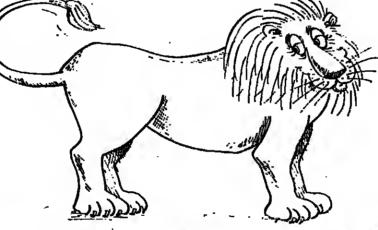
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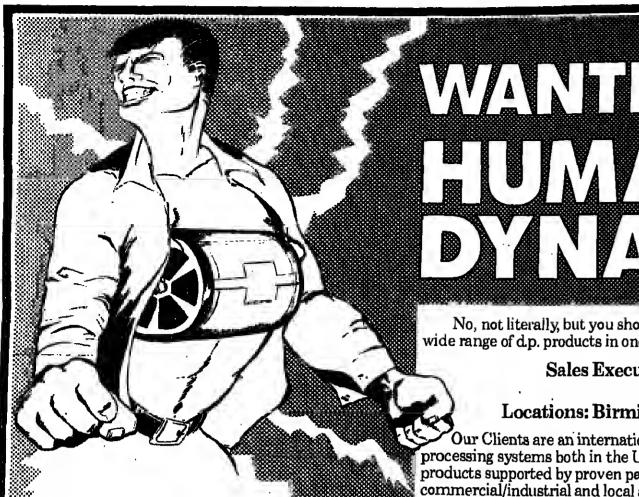
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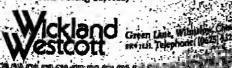
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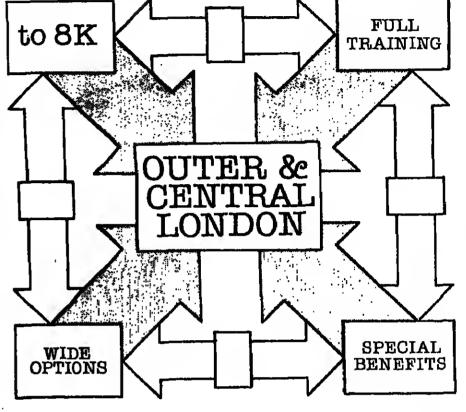
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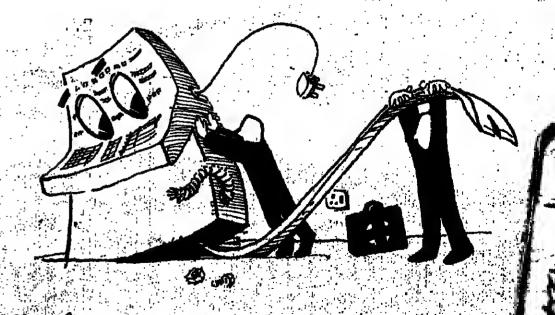
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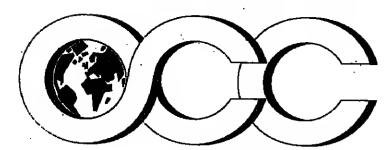
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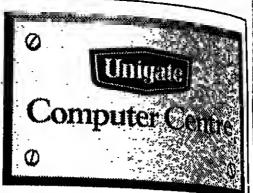
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of three years experiance to systems designers with, sey, eight years plus in States is buying our application expertise in this flaid. ling on your expanenca, specialist skills, and location prefarence, you will make an immadiate atent on one of a range of important. In Software Sciences Micrologic we have a total 'design projects in, for example, defence, business systems, or process control. In and build capability for the application of each of these areas we are industry leaders, and in any of them you will find all the opportunities you need for personal achievement, job satisfaction, and career development.

With a Group as diverse as Software Sciences there is likely to be en opening whetever your qualifications, but we ere particularly looking for mini experience in either commercial or high reliebility real-time applications. Your hardware background mey be on DEC, Data Ganeral, Ferranti, Burrougha, or GEC; end you should have a comprehensive knowledge of one or more Sarah Chembers et our Farnborough head office, indicating your praference.

number of major projects including currency exchange, point of sele terminels, and the UK bookshop Teleordering system. Wa balieve that our commitment to this area is second to Wa have vecancies at a number of lavela, from programmers with a minimum none in the UK softwere industry, and even the United Designers and Programmers

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Alternatively, you may contact her by telephone or latter for an application

Software Sciences Limited

Abbey House 282/292 Farnborough Road, Farnborough Hampshire GU14 7NB Telephone 0252 44321 (Head Office)

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IBM 370 OS North London Fine noted Inatellation requires senior operatore with 2 yrs+ experience. Perks include mortgage allowence. IBM 370 OS Operators with 6 mthe+ experiencs required by busy City based installetion. Good prospects and planty of free time.

IBM 370 DOS Vacencies exiet in all areas for operators with B mthat-experience, in a variety of inetallations offering a wide range

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Shift Leeder required with 2 yrs+ 1900 or 2900 experience. 2 shift working only and some company product discounts.

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to £3800 + BONUS

Our Cliant, the east London Computer Centre of a larga Service Organisation raquires oparations staff with 6 months+ 1900 axparian ca. Tha hardware at presant consists of a 1904A running under Gill. A replacement 1904S is planned latar this year with a 2960 next year.

The company can offer excallent caraar prospacts to ambitious oparators. There are opportunitlas for proficient staff to move off shift into Programming, Production Control or Tachnical Support after a period of 2 years.

Other benefits include a quarterly productivity bonus schame, opportunities for ovartima, subsidised staff restaurant, pension schame, and midweak rest days atc.

For further datails call

Mike Harmer on 01.439.7871

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Minimum of one veers experience for senior operator on e leige 66 system. Pleasant location and calear prospects are

HONEYWELL OS-2000

1B months experience required for company in N.W. London. The main edvantage of this position is no night

UNIVAC EXEC 8

At least three years experience needed for Senior Operator in an installetion in C. London. A thorough knowledge of 1100 series is nacessary for this no nights post.

UNIVAC OS 3

Senior operator with 1B months experience using OS3 is required for a fast developing site with two shifts.

Six months experience needed for junior operators post. All banking perks apply and no night shifts.

An operator with 18 months good NCR experience who is ready fur the CRITERION range is required for 3 shift job.

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COBOL ANALYST/PROGRAMMERS

One of the country's largest retail organisations is seeking severel people with e COBOL beckground, but with an interest in other lenguages. They use a 370/145 & have development projects for a 3031 in COBOL, ASSEMBLER & DL1, & you will

need eround 18 MONTHS or more in any of these Any Analysis or D/B experience would be helpful; however, training will be provided, making this an

ideal opportunity to diversify your career. Rafaranca PG 11/1

PL1 PROGRAMMERS

to C£6500 + Mortgage

A national financial group require good PL1 Progremmera to work on their twin 370/155's & PDP 11 equipment.

They need around 15 MONTHS experience or more in PL1, COBOL or ASSEMBLER, & would also be willing to retrain in BASIC+ for new work on the

Other attrections Include Flextime, Bonusas, and Subsidised Mortgages & Loana after 6 months. Reference PG 11/2

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All you will need is around 12 MONTHS' RPG II experience, on any machine, and not necessarily

within the linancial field. The appointments will offer good career opportunities and future exposure to Systems Analysis, as well as a Non-Contributory pension, Season Ticket loans and a

3% Mortgage. Reference PG 11/6 DATA PROCESSING MANAGER

C. London

An International manufecturing company is seeking a capable & mature DP professional to essume total responeibility for their computer centre. Your background ahould include at least 4 years in DP up to Senior A/P or S/A level, & any proven management experience would be of particular

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Raferanca PG 11/7

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C£8000

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best companias in London.
You should have 5 years experience in either massage switching applications, seles aupport, PDP 11's, turnkey eystema or data communications and wish to progress into a Technical Sales/Sales Support Role. The company offers an excellent salary plue a full penelon schema, intareat free season ticket loens, L.V.'s, ateff purchase facilities and a house purchase

Raference HK 11/3 BASIC + BASIC+2 PROGRAMMERS

London & Home Countles to £8500
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Sceptre House 169-173 Regent Street 01-439 7871 London Wilk 7FB

If you have experience on any mini using these languages please contact us now quoting the reference below.

Datascene Recruitment Ltd.

Reference HK 11/4

ASSEMBLER PROGRAMMERS to C£7500 C. London

This country's foramost Systams House is currently saeking as e matter of urgency saverel PDP 11 Macro Aaaemblar Programmara & Analyst/Programmars.

Your background should include at least 18 months programming in Assembler, not necessarily gained on PDF 11 equipment. in fect, if you have Mainfreme Assembler axperiance and would like to transfer over to ideal opportunity. Any exposure to analysis will

ba more than welcoma.

The projects will all ba pure development work in on-line systems for various large international RDP 11 users, and for the successful applicants there will be a real possibility of worldwide

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A minimum of 2 years FORTRAN coupled with some analysis is required and eny knowledge of graphics would be an adventage.

The company offere very good salarias with all the

Raferanca HK 11/8

H/W & S/W ENGINEERS London & Home Countles £4K - £9K

We have eeveral vacancies for Hardware and Softwara engineers with commissioning or installation

experiance. Cantildatas abould alther have an electronics qualification (BSo/HNC) or good manufacturers

Knowledge of BASIC+ ASSEMBLER, FORTRAN of APL, would be of distinct advantage, gained on either Mainframas, Minis or Micros Reference HK 11/9

Datascene International Ltd. Telex: 25851 Sceptre House 169-173 Regent Street 01-439 1856 London Wilk 7FB

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Our fast growth leads to a 20% yearly increase in our staff. As a consequence, we are looking for top people who are technically competent in their specialist field. Obviously, previous experience on ICL equipment would be a considerable advantage.

Our specific requirements are as follows, and significant additional benefits go with all these appointments.

Project Manager c R25,000

You would plan and manage new projects from their inception, leading and co-ordinating on-site project teams of up to 40 software and hardware specialists. You would be the main link between the customer and your specialists until the installation is in operation (on average about a year).

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You will have difficulty in finding a position with a technical challenge or benefits equal to those you'll

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Our project teams need specialists with expertise in one or more of the following areas:

- Communications
- Operating Systems
- Performance
- Conversion/Transition
- Superstructure

Experience on ICL equipment is obviously an advantage, but exposure to any large operating system is a recommendation. These are challenging positions, needing specialists of a high technical calibre, and we are offering a salary of R18,000-20,000.

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You would then join the project team environment of our Customer Service Division where you would have a wide variety of challenges and be stimulated by the cross-fertilisation of ideas. Salary would be around R14,000.

Prospects? All of these positions offer considerable scope for personal career progression. Indeed it is out policy to develop and utilise fully the potential of our staff. Consider our growth, the excellence of our training, our policy of promotion from within, the wide experience you will gain it would be entirely up to you, your abilities and your ambition.

After generous relocation allowances, our attractive packages will ensure you enjoy a high standard of living - the local spending power of the Rand is about the same as that of the Pound in Britain. Our fringe benefits are excellent, including pension& medical schemes, car allowances and generous leave

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Fortunately this is a young and thriving company with a great deal to offer, whetever your status, a ganuina cerear opportunity is open to those now involved in either of the following arees:

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2) Commercial Applications (Programmer / Analysts or Analysts with Cobol)

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You will play a very important front role assisting the sales team of a large You will play a very imposent front role assisting the sales state of the production of the production of the sales will nacessatoto working on client pramises periodically, escortaining and compiling technical specifications which will assist the sales force to successfully eccomplish their tesks. Applicants must possess a good commercial O.P beckground along with a pleasing and helpful attitude.

For lurther details please quate. CW236.

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To join the IBM team you should have ASSEMBLER experience, ideally using DOS/VS. We also use COBOL so knowledge of this would be an advantage.

To work on DEC systems a commercial programming background on any hardware is required. We will train you to use our software environment, based on the RSX 11M operating system.

You will undertake support work on existing systems which were developed for 1900 series machines and are at present being transferred to our new twin 2960's under

You should have at least 1 year's PLAN experience and COBOL would be an advantage as we will be developing new systems using this language to run under the VME

We Offer

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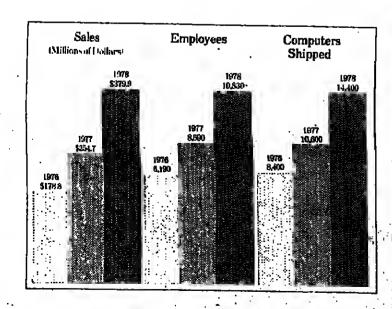
The Company

We're one of the world's foremost minicomputer companies ... each year announcing new highs in sales, earnings, computers sold, facilities occupied and people employed.

A major reason for our success has been the design of compatible hardware products that can be interchanged and function together as integrated systems backed by software that will function with almost any of our systems.

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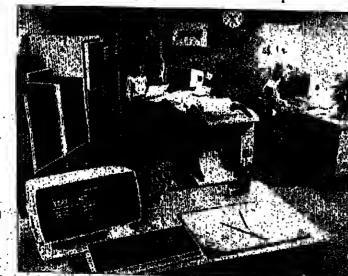


The Position

Right now we're looking for a Software
Development Manager capable of generating the
same growth for our new Software Development
Group. It will be one of the tasks of the successful
candidate to determine the most appropriate
location for the most satisfactory operation of the
Group.

The creation of the new Group emphasises the importance we place on software as a means of growth and of ensuring continued customer acceptance of our products.

You'll be expected to set up a highly professional team from scratch. Its major function will be the development of operating systems, compilers, communications, languages and application programs. We expect you to spend time in the U.S.A. to work in close co-operation with our American operation during the development of the new Group.



Letters of application should be sent to:
David Daley, Personnel Manager, Data General Ltd.,
3rd & 4th Floors, Hounslow House, 724-734 London Road,
Hounslow, Middlesex TW3 1PD.

The Opportunity

It is our intention that the new Group grows quickly but purpose fully. You can expect excellent support from all levels. The corporation has more than doubled its expenditure on software development during the past few years and this trend will continue. This is an outstanding opportunity for a self-motivated professional maner woman, educated to degree level with at least 7/10 years experience in systems software development with a major computer manufacturer — preferably mini's — in managerial and other enpacities. Alternatively you should have a minimum of 5 years experience successfully managing software development teams in a software house.

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Elm D. de Cartis

Edson D. de Castro President Taken from 1978 Annual Reports

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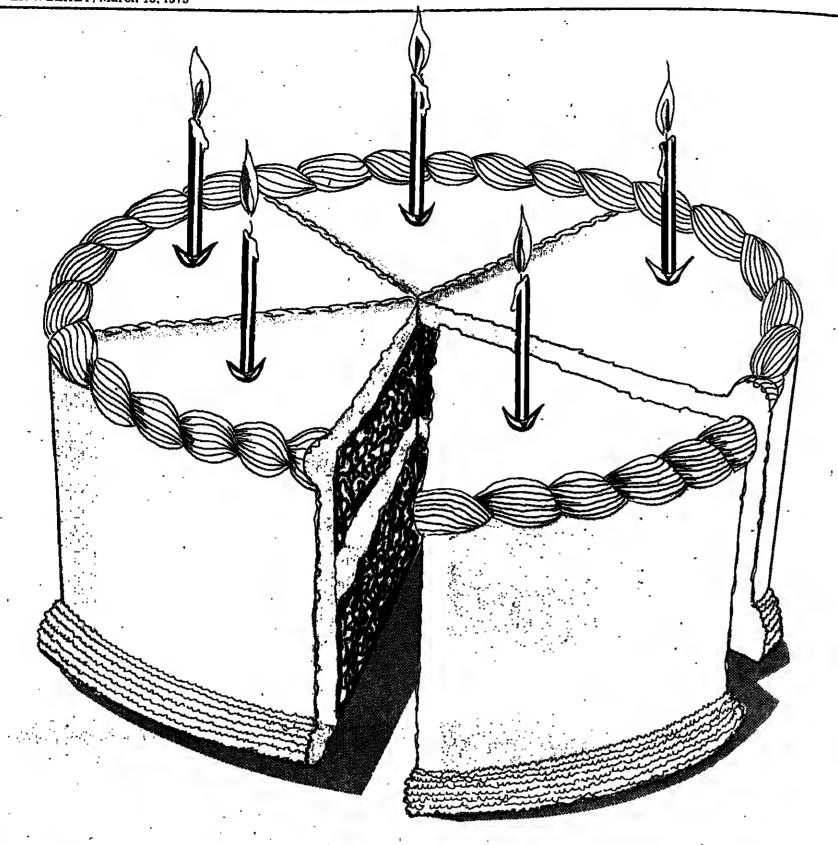
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Year one, 1979, will see the implementation of interactive programming facilities, plus a comprehensive training package using audio-visual equipment. Plus a further four years of things you'd like to be working on, including on-line applications for our unit trust and Insul ince departments.

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You muet either have a minimum of 2 years' Systems Programming experience in DOS/VS environment, and have successfully completed at least one DOS/VS system generation, or a minimum of two years CICS

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ANALYST/PROGRAMMER c. £5,500

With a minimum of three years' programming experience in either COBOLO ASSEMBLER plus some experience in

SENIOR PROGRAMMER c. £5,000
You should have at least four years experience in COBOL and ASSEMBLER.
PROGRAMMER c. £4,500 With a minimum of two years' experience

In either COBOL or ASSEMBLER. The 'fringe' benefits include non-contributory pension and life assurance, BUPA, company assisted savings plans, luncheon vouchers, pald overtime and

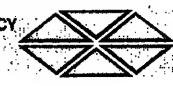
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Dozens of other immediate contracts for

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PROJECT LEADERS SYSTEMS ANALYSTS ANALYST PROGRAMMERS **PROGRAMMERS**

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£ Your asking price Project Laaders COBOL Programmars, banking to £7.000 + travel

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HOME COUNTIES

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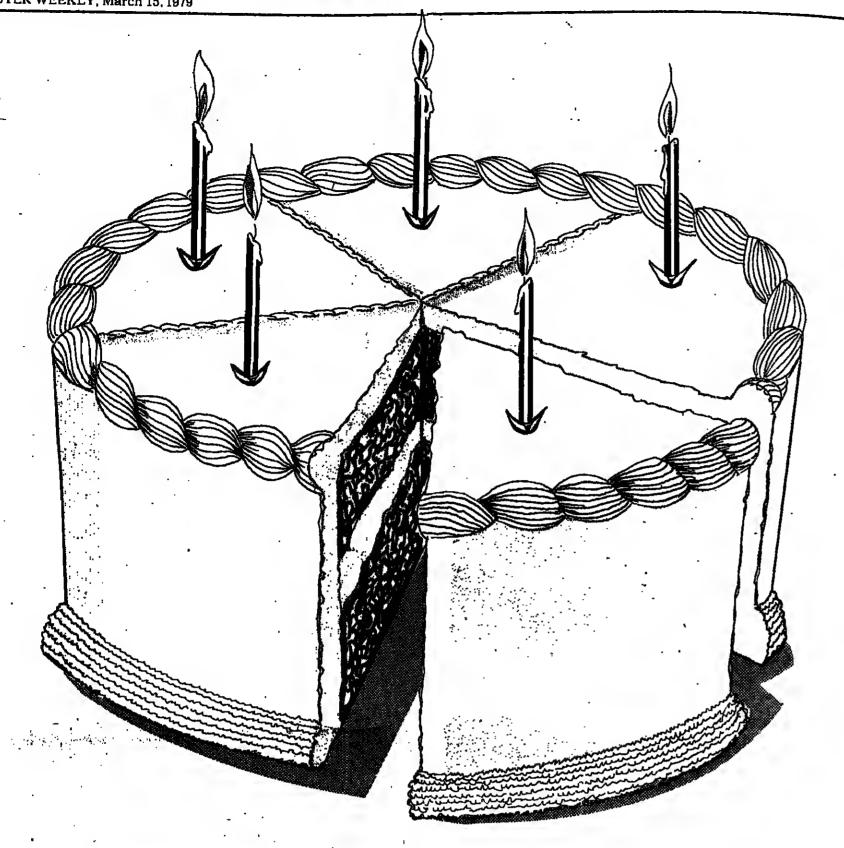
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experienced including some knowledge of CICS generation.

ANALYST/PROGRAMMER c. £5,500
With a minimum of three yeers'
progremming experience in either COBOL®
ASSEMBLER plus some experience in

SENIOR PROGRAMMER c. £5,000
You should have at least four years experience in COBOL and ASSEMBLER.
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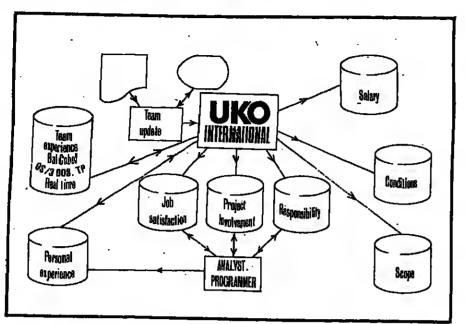
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Systems

Analyst/ **Programmer**

Salary £3,732-£5,073 (in

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necessery).
A sound knowledge of COBOL using Oilect Access techniques is sessoniel and experience in NICOL and ICL softwere utilities would be an edventage. Commencing solary related to

experienco, Consideration will be given to housing accommodation and a generous disturbance allowance schame is in operation. Closing date 27th Merch. 1979, Interview dele 6th

Application forms may be obtained from the Personnel Officer, 3 Marlowe Avenue, Canterbury, Kent CT1 2QN. Telephone: Centerbury 51758, ext. 12.

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A vital source of information

'Everybody sells," and I am uses for evaluating salessure that is a alogan we all men, is one which asks the applaud. Yet one seldom candidates to identify his comes across a correspon- groutest weakness in the ding enthusiaam for context of selling skills. Ineveryone to produce call variably the onswer is

Call repurts are essential documents for instigating unfortunate that innay actions and recording his- companies operate a calt tory. Time after time the reporting system which existence of a call report gives the impression of an proves to be the only source contrance examination for of Informatiun concerning Mensa. what was agreed or said at some meeting that took in their megulomaniac place in the dim and distant past. Sometimes the only way the marketing department is made aware of an aspect of competitive the very opposite effect to activity is by a circulated call report.

recently discussed the ring system must provide inportance of producing a the maximum effect with call report no later than the minimum of effort, inmediately after the call, whether the outcome he Let us now look at the call, action or merely imparting reporting process in terms information. If much of this of its broad application. A call report should be ling boxes (type of call pro-

produced for every face-tu- duetts) discussed, copy to, face contact with a client, ere), so much the better. irrespective of the venue. Telephone contacts should are concerned the they sales also be reported in the same manager, technical director. manner whenever a or whoever), the principal significant topic has been information needed is due.

Call reports are essential a brief statement of the key wherever agreement to take relements of the call, action action of any kind has been. To be taken, name of the made, and especially it such salesman. Any faither decommitment affects other that should be produced out: people in addition to the by way of formal requegenerator of the report. It is essential that interest.

The call report is an ex-

everyone within a sales and marketing environment cellent device for keeping realisee that the importance people up-to-date with of the calt report is not limited to the salesman's domain. stating initials, can ensure
Of course, if these disci-that all interested parties

plines ere to be followed a cell reporting system needs the ensuing benefits sub-

viewing system my com-

receive a copy of his report to be simple. stantially outweigh any of the questions within the structured inter-

BOOK REVIEW reliebility, matritainability

for softwara product en-gineering, by Richerd Gunther. 379 pages. Wileyand quality of human inter This essentiat element

THIS book seems especially suited es a textbook for I have seen, and la so scarce managers, working in softthet TRW-Systems is the ware houses, service only really good exception. bureaux, end computer In the interests of readers suppliers. It can use uny who might consider adapserve as a checklist for anybody who is concerned with the construction or maintemention the following

software product manager logy and the use of who is saddled with the res- automated aids in this proponsibility for getting the cess. All these things coul product out, but who has no anhance company standards upon which to base his work.

TOM GILE

which to base his work.

Finally, it would be a useful source of ideas for software products with less stringent requirements than Gunther presupposes.

It is well illustrated, and well organised The author is practical in his approach blue faces, and well organised The author is practical in his approach of the soft ware engineering/ academic side of the soft ware engineering/ computer science growd here. This reviewer's heart was warmed by the clear was warmed by the clear had consistent use of an explicitly recognised Manage ment, by Objectives approach our page 47 which is followed up in stating product end goals such as end red rear.

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Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Cleo hos accidentally stumbled on the Future System in its huge underground cavern beneath the Sierra Nueva: Hex has been sent there deliberately by the DPM — who has farced him to rethink his ideas on his own ancestry. His tosh is to bring the Future System live ahead of schedule, now that the System is in the throes of a

NEDDY the Sasquatch, Piltdown's clone, conducted Cleo around the plant, describing each new wonder to her in Esperanto. She paid little attention. Rose's diagnosis of pregnsncy had shaken her. He might be wrong; but he had nothing to gain by making it up, since it spoilt his plans for her. She cast her mind back on Hex snd on the single night of passion in the inter-Block Gsp which had isnded her in this predicament — and, she realised, effectively ruined their friendship. While it remsined platonic their relationship had been harmonious: as soon as a physical aspect crept in it had deteriorated.

Perhaps it was too much to expect an android and a human to get on in that sense; but at the time he had seemed very special — en android who had not forsaken his humanity. Then she had believed him capable of jesding them into a brave new world. Now the romentic mist had dispersed and she saw him for what he was, an out-and-out

She was a little disappointed with Neddy too. He seemed to have less of Piltdown's spark of humour, end none of his defiance. Whereas Piltdown had broken loose to roam the world, Neddy had stayed to assist his Frankenstein-creator. Although they were identical twins, they clearly differed in

When she returned to Rose's lab she was none the wiser.
Rose was again at his workbench, hunched over a
microscope. He looked up as they came in.

"So you've finished your semiconducted tour," he "Yes, thank you."

"Neddy pointed out all the highlights, did he?"
"Yes. But I didn't understand a word,"

"All Greek to you, i suppose."
"Greek I can manage." she replied. "Esperanto's the

langusge barrier." lmm. Well, you can't stay."

"Cnn I go back to the surface?"

the spoke a few sentences in Esperanto to the apeman. Then the rallcar arrived, McNull stepped out, followed by "Who are you?" demanded Rose. Hex and Cleo gaped at each other open-mouthed.

'i sald; who are you?" repented Rose. McNull answered first. "It came to pass in the last days of

"No. You will have to be disposed of."

I thought you were in charge."

the terminus station.

There was a pause. Clco waited for him to spell it out.

"Here, yes. But you're not wanted here. I'm packing you off to Fort Ranfour. Come this way. There's a subway link."

He led them out again. They threaded their way among the bustling automate down several flights of stoirs. They

came to a massive steel bulkhend which swung open

noiselessly on his approach. Passing through, they entered

"This is our link with the outside world," said Rose. "We're in luck; there's a train coming, Neddy will accompany you on the journey. Then the DPM can decide your

"I'm handing you over to my superiors," he concluded at

the System that a great pestilence raged over the land. And

In those days travelled the chosen android and his disciple, from the heart of the Old System unto the birthplace of the new...."
"We've been sent by the DPM," interrupted Hex, emerging from his trance. "I am the Hexadecimal Kid and this is

the Wizard of Os. We're software consultants. We've come

to help you get this thing off the ground."
Rose's eyes narrowed. "Where ure your credentials?"
"We haven't any. There wasn't time," explained Hex.

"The System is going gigotic."
"What? I've heard nothing of this."
"All data communication has been cut in an attempt to

stop it spreading," Hex replied. "We must get the Future System running before it's too lete. Lead us to the commend console; there's no time to lose.

Rose laughed. "I like it: two jokers calling themselves consultants turn up with some helf-baked story and not an ID-card between them demanding to go straight to Mission Control. I have to admire your effrontery."

Hex saw they were getting nowhere. As a last resort he tried the cryptic pass-phrase which the DPM had instructed them to use: "Two years' Cobol experience".

Rose's expression changed. "Now that's quite another metter," he said deferentially. "Why didn't you say so in the first place? Come with me and I'll show you what to do."

When they were all back in his lab he aaked Hex, "How

much do you know about the project?"
"Only that the Future System is called BOSS, for Bionic

Operating System Supervisor." "I'd better begin at the beginning," responded Rose. "Originally I was a neurophysiologist, but I got bored with cutting brains out of monkeys. I wanted something more

"Such as putting brains but monkeys," Cleo suggested, glancing at Neddy.
"Exactly. I sturted messing about with electronics. But

you'll notice that Neddy is not an ordinary android: he has no electronic parts. You see, I grew convinced that silicon chip technology and neared its limits. I sought a purely higherical alternative. There's more organising ability in one protein molecule than on a whole sinb of silicon. I turned from microprocessors to micro-organisms. In short, I began to dream of the self-reproducing computer.

"So when the System was recruiting for the Advanced Systems Group they selected me. I joined, and eventually became director. Now I am the only one left, apart from robotic functionaries. The development phase is being wound down; it has ubmost reached its conclusion. We have made the ultimate biotechnical breakthrough."

He turned round and picked up a flask of clear fluid. "Look," he declaimed, "n programmable virus! There's enough information in its DNA to turn an elephant into an IBM 360."

Appeal to DP

science students

"Not the other way around?" queried Clea imacemly. What witch's brew has he cancocted? Next wook the cauldro

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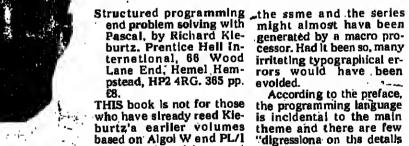
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nal, 68 Wood Lane End, Finally the book considers the dsvicaa currently avail-able and aome of the appli-in the book, and eagerly

software.

I was hoping to find gates than extra connections. But I was diaap-





THIS book is not for those who have stready read Kieburtz'a earlier volumes based on Algol W end PL/1 or those who might expect to learn Peacal from this There are chapters on the control of the preface, the programming language is incidental to the main theme and there are few digressions on the details of usage" of Pescal.

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